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INSTALLATION ASSESSMENT OF THE HEADQUARTERS, U.S. ARMY AIR DEFENSE CENTER AND FORT BLISS, TEX.
REPORT NO. 335

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Assessments Division
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INSTALLATION ASSESSMENT

FOR

U. S. ARMY AIR DEFENSE ARTILLERY CENTER AND FORT BLISS, TEXAS

Report No. 335

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An onsite installation assessment was conducted Feb. 7-11, 1983, at the Headquarters, U.S. Army Air Defense Center and Fort Bliss (FTBL), Tex., to determine the presence of any toxic or hazardous materials and to assess the potential for offpost migration. Based on the findings of this assessment, a field survey was not recommended.

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SUMMARY

An onsite installation assessment was conducted Feb. 7-11, 1983, at the Headquarters, U.S. Army Air Defense Center and Fort Bliss (FTBL) to assess past and current use of toxic and hazardous materials, as well as the potential for these substances to migrate off the installation.

The initial installation assessment identified the following problem areas:

1. The current method of handling waste petroleum, oils, and lubricants does not ensure that hazardous wastes are not mixed with the waste petroleum, oils, and lubricants. This presents a potential safety risk to firefighting personnel which use the waste oil for training exercises, as well as being in violation of Resource Conservation and Recovery Act regulations for disposal of hazardous wastes.
2. Waste motor oil generated by vehicle maintenance activities is being taken offpost for sale and/or recycling. At the time of the site visit, no official authorization or contract existed for this practice; however, the installation was working to establish a formal contract with a waste oil recycling company.
3. Raytheon disposes of waste solutions containing unknown concentrations of chromium in a concrete tank near Bldg. 11005. These solutions have not been tested to determine if they are toxic/hazardous according to U.S. Environmental Protection Agency (EPA) protocol. If classified as toxic/hazardous, this would constitute improper disposal of toxic/hazardous wastes. At the time of the site visit, the U.S. Army Environmental Hygiene Agency was conducting an evaluation of this disposal operation, including sampling and analysis of soil and sludge samples.
4. Pesticide storage facilities (Bldgs. 60-277, 1235, 11160, and 3007) lack continuous curbing, contrary to recommended EPA procedures.

In addition, Bldgs. 1235 and 3007 are not marked with toxic/hazardous materials storage warning signs, contrary to EPA and U.S. Army regulations.

5. Small quantities of pesticides are stored by the Directorate of Engineering and Housing Entomology Section in an area used for food consumption, contrary to EPA and U.S. Army regulations.
6. Pesticide-contaminated rinseates generated by the Directorate of Engineering and Housing Entomology Section and Grounds Maintenance Section are disposed of by open dumping, contrary to EPA and U.S. Army regulations. Several potable water sources used for mixing pesticides are not equipped with backflow-prevention devices.
7. Grounds Maintenance Section personnel involved in the application of herbicides are not certified, contrary to U.S. Army regulations.
8. Polychlorinated biphenyls and polychlorinated-biphenyl-containing items are currently stored in a recently constructed facility (Bldg. 11614) which conforms to EPA regulations, with the exception that the facility is not appropriately marked with signs indicating polychlorinated-biphenyl storage.
9. Polychlorinated-biphenyl-contaminated floor sweep is stored in Bldg. 11122, which does not conform to EPA requirements for storage of polychlorinated biphenyls.
10. Unserviceable low-level radioactive supply items (rifle sights, compasses, etc.) used by various military units are not turned in to the Radiation Protection Officer for disposition, as required by Army Regulation 385-11.
11. Underground petroleum, oils, and lubricants storage tanks are not properly leak checked, contrary to EPA regulations.
12. The current Spill Prevention Control and Countermeasure/Installation Spill Contingency Plan does not meet specifications required by EPA and U.S. Army regulations.
13. Wash racks are not routinely maintained, resulting in washwater discharges to the stormwater drainage system, in violation of EPA regulations.

14. The disposition of battery acid neutralization and paint spray booth wastewater discharged to drains at the Directorate of Industrial Operations Materiel Readiness Division is not known. If these drains dis-harge to the stormwater drainage system, a National Pollutant Discharge Elimination System permit would be required.
15. The installation currently is not in compliance with EPA regulations with regard to sampling and analysis of residues from explosives and ammunition demolition activities.

Available geological evidence, information on contaminant sources, and water quality data do not indicate the offpost migration of contaminants via surface or subsurface waters; therefore, a followup survey by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) is not recommended. However, the following actions by FTBL are recommended:

1. Institute a procedure to effectively segregate waste hazardous materials from waste petroleum, oils, and lubricants, and dispose of hazardous wastes in accordance with regulations.*
2. Continue the current efforts to establish a formal contract with a waste petroleum, oils, and lubricants recycling/disposal company.*
3. Perform Resource Conservation and Recovery Act hazardous/toxic tests on the waste solutions generated by Raytheon and take appropriate action regarding future disposal methods; continue with the program to evaluate the degree of soil contamination, if any, in the vicinity of the disposal tank and take appropriate action.*
4. Continue with the plan to construct a proper pesticide storage facility. In the interim, place toxic/hazardous materials storage warning signs on all buildings in which pesticide chemicals are stored.*
5. Discontinue the practice of storing pesticides in areas where food is consumed.*
6. Discontinue the practice of open dumping pesticide-contaminated rinseates. Install backflow-prevention devices on potable water sources used for pesticide formulation.*

7. Obtain certification of Grounds Maintenance Section personnel involved in the application of herbicides.*
8. Install polychlorinated-biphenyl warning signs on the facility in which polychlorinated biphenyls are stored.*
9. Properly store polychlorinated biphenyl-contaminated floor sweep.*
10. Institute a procedure for turn-in of unserviceable low-level radioactive supply items to the post Radiation Protection Officer for disposition, as required by Army regulations.*
11. Institute a program to properly test underground petroleum, oils, and lubricants storage tanks for leakage.*
12. Update the Spill Prevention Control and Countermeasure/Installation Spill Contingency Plan to meet EPA and Army regulations.*
13. Properly maintain wash racks to ensure washwaters are not discharged to the stormwater drainage system.*
14. Determine the disposition of discharges from the drains at the Directorate of Industrial Operations Materiel Readiness Division used to dispose of battery acid neutralization wastewaters and paint spray booth wastewaters. If these drains discharge to the stormwater drainage system, take appropriate action to bring these discharges into compliance with EPA regulations.*
15. Bring the demolition sites into compliance with EPA regulations regarding sampling and analysis of demolition residues.*

*Subsequent to the site visit, the following actions have been reported by FTBL (Keyed to Recommendations):

1. The FTBL Hazardous Waste Management Plan restricts the contamination of used oil with hazardous waste so that all used oil can be recycled under the Resource Recovery Plan.
2. A used oil pickup contract (METRO Oil Corp., Tucson, Ariz., Contract No. 41-3250-002, effective dates: Apr. 8 to Sept. 30, 1983) has been instituted.
3. FTBL is currently in touch with the U.S. Army Environmental Hygiene Agency and the U.S. Army Training and Doctrine Command to evaluate all possible contamination.

4. In the near future, warning signs will be placed on all buildings in which pesticide chemicals are stored.
5. The practice of storing pesticides in areas where food is consumed has been discontinued.
6. Contaminated rinseates will be used as a solution base for preparation of further perticide solutions.
7. Emphasis is being given to achieve the goal of certification for all personnel.
8. Warning signs have been posted on two sides of the building, the main door and the west side wall.
9. Polychlorinated-biphenyl-contaminated floor sweep is properly stored.
10. The installation has notified the U.S. Army Health Services Command, William Beaumont Army Medical Center's Preventive Medicine Activity, and a standing operating procedure is being developed to correct current procedures.
11. The Environmental Protection Office, Directorate of Engineering and Housing, will develop a program in the near future which will cover all necessary precautions to prevent a spill of any kind (including underground tanks).
12. The Spill Prevention Control and Countermeasure and Installation Spill Contingency Plans were updated in April 1983, and they have been distributed.
13. A service contract was awarded to clean all wash racks and to put them in serviceable order. The fact that maintenance of wash racks is a troop responsibility was emphasized to units concerned.
14. These operations discharge their wastewater into the city of El Paso's sanitary sewer. The disposal of battery acid has been discontinued, and undrained batteries are now being given to the Department of Energy for recycling.
15. In the near future, the U.S. Army Environmental Hygiene Agency will perform tests.

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AAFES	Army and Air Force Exchange Service
ACR	Armored Cavalry Regiment
ADA	air defense artillery
ADCSS	Air Defense Command Simulation System
AFB	Air Force Base
AG	aboveground
AQCR	Air Quality Control Region
AR	Army Regulation
ARRCOM	U.S. Army Armament Materiel Readiness Command
ARTEP	Army Training Evaluation Program
ASA	Army Security Agency
ASP	ammunition supply point
AVGAS	aviation gasoline
BAA	Biggs Army Airfield
BLM	Bureau of Land Management
BML	byproduct material license
°C	degrees Celsius
cal	caliber
CB	chemical/biological
CECOM	U.S. Army Communications and Electronics Command
Ci/yr	curies per year
cm	centimeters
CO	carbon monoxide
COE	U.S. Army Corps of Engineers
CONUS	Continental United States
DA	Department of the Army
DARCOM	U.S. Army Materiel Development and Readiness Command
DDESB	Department of Defense Explosives Safety Board
DDS	Directorate of Dental Services
DEH	Directorate of Engineering and Housing

DEIS	draft environmental impact statement
DENTAC	U.S. Army Dental Department Activity
DHS	Directorate of Health Services
DIO	Directorate of Industrial Operations
DIVAD	Division Air Defense
DOD	Department of Defense
DPCA	Directorate of Personnel and Community Activities
DPDO	Defense Property Disposal Office
DPT	Directorate of Plans and Training
DS/GS	direct support/general support
DT	developmental test
EA	environmental assessment
EIA	environmental impact assessment
EOD	Explosive Ordnance Detachment
EODCC	Explosive Ordnance Detachment Command Center
EPA	U.S. Environmental Protection Agency
EPIC	Environmental Photographic Interpretation Center
EPO	Environmental Protection Officer
ES	exclusion statement
FAW	forward area weapon
FESA	Facilities Engineering Support Activity
FFAR	folding-fin aerial rocket
FM	frequency modulation
FORSCOM	U.S. Army Forces Command
FTBL	Headquarters, U.S. Army Air Defense Center and Fort Bliss
FTX	field training exercise
FY	fiscal year
gal	gallons
GSA	General Services Administration
ha	hectares
HE	high explosive
HQ	Headquarters
IFFN-JTF	Identification Friend, Foe, or Neutral Joint Force
IIA	Initial Installation Assessment

in	inches
ISCP	Installation Spill Contingency Plan
ISSA	Interservice Support Agreement
JTX	joint training exercise
kg	kilograms
kg/yr	kilograms per year
km	kilometers
km^2	square kilometers
km/yr	kilometers per year
l	liters
LAO	Logistics Assistance Office
LAW	light antitank weapon
lb	pounds
l/month	liters per month
LOI	Letter of Instruction
lpm	liters per minute
lpy	liters per year
LSV	liquid scintillation vial
m	meters
mCi	millicuries
mg/l	milligrams per liter
MICOM	U.S. Army Missile Command
MISPC	mechanized infantry squad proficiency course
MLD	million liters per day
MOGAS	motor vehicle gasoline
mm	millimeters
MRD	Materiel Readiness Division
m/s	meters per second
MSA	Morale Support Activity
MSL	mean sea level
N	nitrogen
NAMSA	NATO Maintenance Support Activity
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, chemical

NCO	Noncommissioned Officers
NIPDWR	National Interim Primary Drinking Water Regulations
NOE	Nap-of-the-Earth
NO_x	nitrogen oxides
NRC	U.S. Nuclear Regulatory Commission
NSDWR	National Secondary Drinking Water Regulations
ORDCIT	Ordnance California Institute of Technology
OSD	Office of the Secretary of Defense
OT	operational test
PCB	polychlorinated biphenyl
pCi/l	picocuries per liter
POL	petroleum, oils, and lubricants
ppm	parts per million
PVNTMED	Preventive Medicine
PX	Post Exchange
RCRA	Resource Conservation and Recovery Act
RPO	Radiation Protection Officer
SHRAM	short-range attack missile
SNM	Special Nuclear Material
SOP	standing operating procedure
SO_x	sulfur oxides
SPCC	Spill Prevention Control and Countermeasure
SSPC	single-shot probability course
STB	super topical bleach
STORET	Storage and Retrieval
STP	sewage treatment plant
STRAF	Strategic Army Forces
T	trace
TACOM	U.S. Army Tank-Automotive Command
TASC	Training Aids Support Center
TB	Technical Bulletin
TDS	total dissolved solids
TECOM	U.S. Army Test and Evaluation Command
TFA	terrain flying area
THM	trihalomethanes
TMDE	Test, Measurement, and Diagnostic Equipment

TON	Threshold Odor Number
TOSCA	Toxic Substances Control Act
TOW	tube-launched, optically-tracked, wire-command link
TPT	target practice with tracer
TRADOC	U.S. Army Training and Doctrine Command
TSARCOM	U.S. Army Troop Support and Aviation Materiel Readiness Command
uCi	microcuries
UG	underground
ug/m^3	micrograms per cubic meter
USAADCENFB	Headquarters, U.S. Army Air Defense Center and Fort Bliss
USAADS	U.S. Army Air Defense School
USACC	U.S. Army Communications Command
USACIDC	U.S. Army Criminal Investigation Command
USADWSP	U.S. Army Drinking Water Surveillance Program
USAEHA	U.S. Army Environmental Hygiene Agency
USAETL	U.S. Army Engineer Topographic Laboratories
USAF	United States Air Force
USAINSCOM	U.S. Army Intelligence and Security Command
USAOTEA	U.S. Army Operational Test and Evaluation Agency
USAR	U.S. Army Reserve
USARADBD	U.S. Army Air Defense Board
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USMC	U.S. Marine Corps
USSCS	U.S. Soil Conservation Service
UXO	unexploded ordnance
WBAMC	William Beaumont Army Medical Center
WP	white phosphorus
WSMR	White Sands Missile Range
WWII	World War II

1.0 GENERAL

1.1 PURPOSE OF THE ASSESSMENT

To determine the existence of toxic and hazardous materials and related contamination at the Headquarters, U.S. Army Air Defense Center and Fort Bliss (FTBL), Tex., emphasizing those substances posing a potential for migration off the installation.

1.2 AUTHORITY

U.S. Army Materiel Development and Readiness Command (DARCOM) Regulation 10-30, Mission and Major Functions of the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), July 30, 1981.

1.3 INTRODUCTION

1. In response to a letter from the Commander, USATHAMA, requesting the identification of potentially contaminated installations, the Commander, U.S. Army Training and Doctrine Command (TRADOC), recommended that FTBL be included in the Installation Restoration Program.
2. Presurvey instructions were forwarded to FTBL by letter to outline assessment scope, provide guidelines to FTBL personnel, and obtain advance information for review by the Initial Installation Assessment (IIA) Team.
3. FTBL personnel were briefed by a USATHAMA representative on the Installation Restoration Program on Feb. 3, 1983, prior to the onsite records search.
4. Various Government agencies were contacted for documents pertinent to the records search effort. Agencies contacted include:
   a. Department of Defense Explosives Safety Board (DDESB), Alexandria, Va.
   b. U.S. Army Environmental Hygiene Agency (USAEHA), Aberdeen Proving Ground, Md.

c. State of Texas, Parks and Wildlife Department, Austin, Tex.

d. State of Texas, Organization for Endangered Species, Austin, Tex.

e. State of Texas, Department of Water Resources, Austin, Tex.

f. State of Texas, Bureau of Economic Geology, University of Texas, Austin, Tex.

g. U.S. Environmental Protection Agency (EPA) Environmental Photographic Interpretation Center (EPIC), Vint Hill Farms Station, Warrenton, Va.

h. EPA Storage and Retrieval (STORET) Water Quality Data Base.

i. U.S. Geological Survey (USGS), Denver, Colo.

j. U.S. Army Engineer Topographic Laboratories (USAETL), Fort Belvoir, Va.

k. Washington National Records Center, Suitland, Md.

l. U.S. Soil Conservation Service (USSCS), Temple, Tex.

m. National Archives and Records Service (Navy and Old Army Branch; Modern Military Branch), Washington, D.C.

5. The onsite phase of the records search was conducted Feb. 7-11, 1983. The information presented in this report is current, as of the date of the onsite search. The following personnel from ESE, under Contract No. DAAK11-81-C-0093, were assigned to the onsite team:
   - Mr. Charles Hendry, Team Leader
   - Ms. Barbara Denahan, Hydrogeologist
   - Mr. William Fraser, Environmental Engineer
   - Ms. Carla Jones, Historian
   - Mr. Jackson Sosebee, Chemist
   - Mr. John Wiese, Ecologist
6. In addition to the records review, interviews were conducted with former and current employees. Ground tours of the installation were made, and photographs were taken.
7. Only those directorates, tenants, and activities potentially involved in the handling, production, testing, and disposal of contaminants were investigated.

1.4 CURRENT INSTALLATION ORGANIZATION

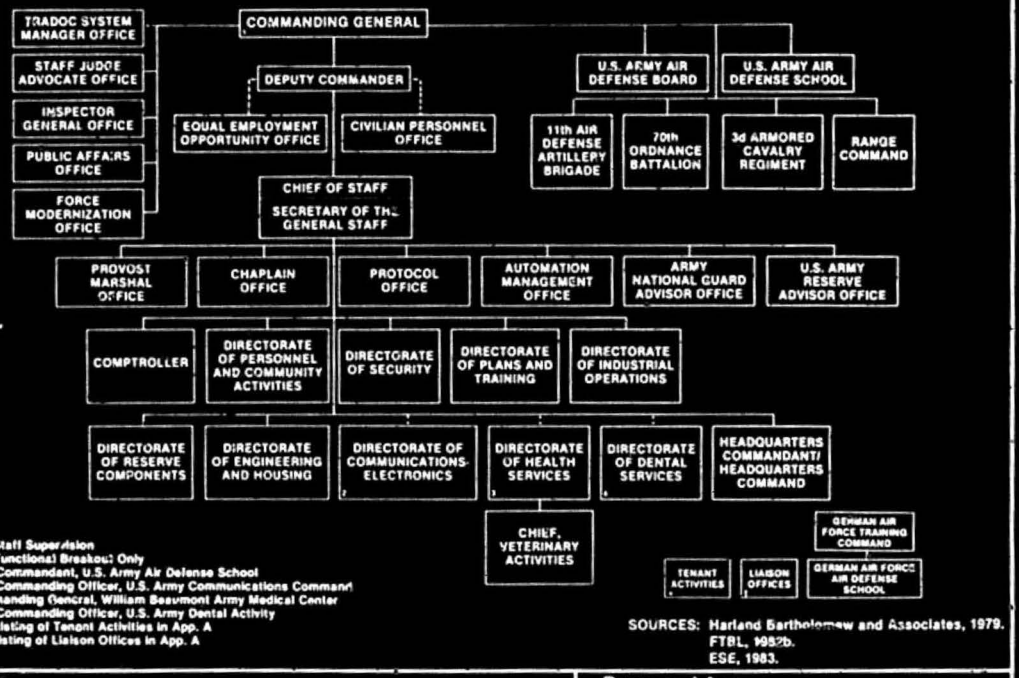
FTBL is a TRADOC installation and the home of the U.S. Army Air Defense Center, whose principal mission is to provide training and logistical support for the Army's air defense weapons systems. An expanded description of the mission of FTBL can be found in Regulation 10-1 (FTBL, 1982b). FTBL is the only installation in the Continental United States (CONUS) with ranges suitable for firing long-range missiles such as the Hawk. Consequently, FTBL facilities support units of the U.S. Army Forces Command (FORSCOM) [i.e., 11th Air Defense Artillery (ADA) Brigade, 70th Ordnance Battalion, and 3d Armored Cavalry Regiment (ACR)] and training activities of other branches of the U.S. Department of Defense (DOD) and units of other Allied Nations (Harland Bartholomew and Associates, 1979).

Five major subordinate commands exist on FTBL, including the three FORSCOM units mentioned previously, Range Command, the U.S. Army Air Defense School (USAADS), and the U.S. Army Air Defense Board (USARADBD). Detailed mission statements and organizational charts illustrating elements under the control of each subordinate command are contained in Headquarters, U.S. Army Air Defense Center and Fort Bliss (USAADCENFB) Regulation 10-1 (FTBL, 1982b). Activities involving toxic/hazardous materials which are conducted by these commands are discussed in Sec. 2.

Fig. 1.4-1 illustrates the organizational structure of FTBL. Tenant activities and directorates which support the activities of FTBL are discussed in the following sections.

1.4.1 DIRECTORATES

Nine directorates support the overall mission of FTBL and report to the Commanding General through the Chief of Staff (see Fig. 1.4-1). Seven of these administer activities involved with toxic/hazardous materials. These are listed below, followed by brief mission statements (FTBL,



SOURCES: Harland Bartholomew and Associates, 1979.
FTBL, 1982b.
ESE, 1983.

Figure 1.4-1
ORGANIZATIONAL CHART OF FORT BLISS

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U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

1982b). Specific information concerning these activities appears in Sec. 2.

1. Directorate of Personnel and Community Activities (DPCA): advises and assists the Chief of Staff and the Commanding General on matters pertaining to personnel and provides personnel services and management; operates a photographic laboratory, arts and crafts shop, and reproduction facility; maintains the golf course (including pesticide application) and other onpost recreational facilities; and administers installation drug and alcohol abuse and safety programs.
2. Directorate of Plans and Training (DPT): advises and assists the Chief of Staff and the Commanding General in the development, coordination, and supervision of matters relating to training, plans, operations, unit readiness, training aids, and aviation.
3. Directorate of Industrial Operations (DIO): advises and assists the Chief of Staff and the Commanding General on all matters pertaining to the planning, coordination, supervision, and control of logistics support functions and operates installation maintenance, services, supply, transportation, procurement, and logistical planning activities.
4. Directorate of Engineering and Housing (DEH): provides real estate management and maintenance activities (e.g., wildlife conservation, master planning, maintenance and repair shops operation, refuse disposal, pest control, etc.) and advises and assists the Chief of Staff and the Commanding General on facilities engineering activities.
5. Directorate of Health Services (DHS): advises the Chief of Staff and the Commanding General on matters pertaining to health care services and environmental health services for FTBL, including veterinary activities. The Director of Health Services also serves as the Commanding General of the William Beaumont Army Medical Center (WBAMC).

6. Directorate of Dental Services (DDS): advises the Commanding General on matters pertaining to dental health care services for the installation. The Director of Dental Services is also the Commanding Officer, U.S. Army Dental Activity (DENTAC).

In addition to these directorates supporting the overall mission of FTBL, six directorates fall under the USAADS: Directorate of Support, Directorate of Evaluation and Standardization, Directorate of Combat Developments, Directorate of Training Developments, Directorate of Training and Doctrine, and Directorate of Ballistic Missile Defense. These oversee the various training and instructional programs conducted by USAADS. A detailed mission statement for each is contained in Regulation 10-1 (FTBL, 1982b).

1.4.2 TENANT ACTIVITIES AND LIAISON OFFICES

A comprehensive listing of tenant activities onpost at the time of the site visit appears in App. A. The majority of these activities occupy space on FTBL under inter/intraservice support agreements (ISSAs) on file with DIO. Those involved with toxic/hazardous materials are listed below, followed by brief mission statements (FTBL, 1982b).

1. DARCOM Logistics Assistance Office (LAO): provides experts for technical assistance to activities located on FTBL (see Sec. 2.1.4). These experts are supplied through subordinate offices under the administration of DARCOM LAO (see App. A). One of these subordinate offices, the U.S. Army Missile Command (MICOM), employs contractors to assist in accomplishing its mission to supply small target planes for USAADS instructional purposes. The contractors currently include Beech Aerospace Services, Inc. (Hawk target missiles); Brunswick Corp. [aerial targets for Division Air Defense (DIVAD) gun systems]; Cartwright Engineering, Inc. (scoring instrumentation for aerial targets); Raytheon Co. (modifies, repairs, and checks Hawk systems, supports fielding of Patriot systems, provides telemetering services during annual service practice firings);

General Dynamics (maintains and repairs Stinger systems); and Applied Devices, Inc. (provides training and maintenance on the Improved Hawk Simulator). Reportedly, McDonnell Douglas and Western Electric were employed as contractors in the past. Raytheon is the largest contractor operation onpost. Activities conducted by Raytheon involving toxic/hazardous materials are outlined in Sec. 2.1.2.

2. Defense Property Disposal Office (DPDO): receives, stores, and disposes of all excess property generated at FTBL.
3. DENTAC: provides dental diagnosis, care, treatment, consultation, and preventive dental programs to eligible personnel.
4. Nuclear Weapons Support Detachment: located in Bldg. 2538, this activity has a classified mission (see Sec. 2.1.7, Radiological Materials).
5. WBAMC: provides medical care for eligible military personnel and civilians and operates X-ray, laboratory, silver recovery, and incinerator facilities.
6. Area Test, Measurement, and Diagnostic Equipment (TMDE) Support Team Calibration Services: operates as a DARCOM detachment to provide testing, calibration, and repair services for measuring and diagnostic equipment, including radiological monitoring devices (see Sec. 2.1.7).

In addition to tenants, several liaison offices are located at FTBL (see listing in App. A). None of these are involved with the handling, generation, or disposal of toxic/hazardous materials.

1.5 INSTALLATION HISTORY

1.5.1 GENERAL HISTORY

Named in honor of Brevet Lt. Col. William Wallace Smith Bliss, who served as Gen. Zachary Taylor's Chief of Staff during the war with Mexico and later as President Zachary Taylor's private secretary, FTBL was officially established in 1848 to maintain the newly established

United States-Mexican border and to protect traders and settlers from hostile attack. The fort was originally located at the site of the Smith Ranch (currently downtown El Paso) and was occupied and abandoned alternately with fluctuations in the strength of Indian hostility. The town of E. Paso (also called Franklin) grew in conjunction with the post.

In 1851, the post at Smith's Ranch was abandoned, but by 1854, attacks against settlers had increased considerably, necessitating the creation of a formal military garrison. The new post, named FTBL, was located at Magoffinsville (currently the area between Magoffin Ave. and Willow St.). In March 1861, FTBL was occupied by Texas troops of the Confederacy. In 1862, however, Union forces captured the fort and retained control until the close of the Civil War. In 1865, the 5th U.S. Infantry garrisoned the fort and remained until 1868, when floods from the Rio Grande seriously damaged the post and forced evacuation. The garrison was moved to higher ground, on 40 hectares (ha) of land leased from the owners of the Concordia Ranch. The post was officially designated Camp Concordia at that time but was renamed FTBL in 1869.

Escalation of Indian hostilities in the 1870s and 1880s and the need to complete construction of the railway lines into El Paso under peaceful conditions led the Army to purchase 54.6 ha of land at Hart's Mill in 1879 for the construction of a permanent military post. This property proved too small, however, and in 1890, Congress authorized that it be sold and that at least 400 ha of suitable land be acquired. In 1891, a new site 8 kilometers (km) from the center of El Paso at La Noria Mesa (the site of current FTBL) was selected and was ready for occupancy by the 18th U.S. Infantry in 1893. Nearly all of the buildings constructed during this period are still in use.

FTBL remained relatively inactive during the late 1890s and early 1900s, until raids by Gen. Francisco (Pancho) Villa across the Rio Grande into New Mexico and Texas began in 1914. At that time, Brig. Gen. John

J. Pershing was given command of FTBL and the 60,000 troops garrisoned there. The Mexican confrontations were resolved in 1917, and FTBL became an important training center for World War I troops.

Until 1912, FTBL had been primarily an infantry post, but through World War I and until World War II (1943), its main purpose was training and support of cavalry troops. The removal of cavalry troops from the modern Army led to another mission change at FTBL. In 1944, FTBL became the center for United States antiaircraft training, with the transfer of the Antiaircraft Artillery School and Antiaircraft Artillery Board to FTBL from Camp Davis, N.C. In 1946, Werner von Braun and other German scientists began studies on captured V-2 rockets at FTBL, thereby initiating an era of guided missile research.

The 1950s at FTBL were characterized by expansion of facilities and greater involvement in training and testing of Nike and Hawk missiles, including nuclear systems. In 1957, the Antiaircraft Artillery and Guided Missile School (until 1948, the Antiaircraft Artillery School) was redesignated the USAADS, and FTBL became the Headquarters, U.S. Army Air Defense Center, which it remains to the present.

Major land acquisitions have occurred at FTBL in response to its expanding mission. Aircraft activities began at FTBL in 1916 on a small field at the main post. Biggs Field was established in 1925 and named in honor of a flyer from El Paso who was killed testing a new plane in France. Biggs Field was relocated to its present site in 1940. When the U.S. Air Force (USAF) was created as a separate branch of the military in 1947, Biggs Field was transferred to the USAF and renamed Biggs Air Force Base (AFB). It remained under USAF control until 1966, when it reverted to the Army and became Biggs Army Airfield (BAA).

Hospital facilities on FTBL originated with the William Beaumont General Hospital, which operated from 1921 to 1977 on land just to the east of

the current WBAMC. Named in honor of a renowned American physiologist, WBAMC began in 1972.

With the exception of Dona Ana Range, for which land was acquired as early as 1911, the primary range areas at FTBL were acquired gradually between 1946 and 1957 through lease agreements and direct purchase. During World War II, exclusive use agreements for Manuever Area II were acquired. These were renegotiated as co-use agreements following the war, and the land area was reduced. These agreements were renewed every 5 years until 1975, when Congress directed that the Army acquire the land through purchase. McGregor Range was withdrawn from public domain in 1957 to provide sufficient impact areas for long-range missile firings (FTBL, 1979; Whalen et al., 1978; FTBL, 1964).

1.5.2 ARCHAEOLOGICALLY AND HISTORICALLY SIGNIFICANT AREAS

FTBL currently maintains an aggressive and innovative program of historic resources management. To date, all of the maneuver areas onpost have been surveyed and about 10,000 sites of archaeological/historical significance had been identified. In 1981, 28 archaeological districts were established in the maneuver areas, all of which have been determined eligible for inclusion on the National Register of Historic Places by historical experts from FTBL, Texas and New Mexico, and the National Register staff. The sites included in the 28 districts represent the total range of prehistory. Artifacts uncovered date as early as 8,000 B.C. and include remnants of pottery, cracked rock, and remains of adobe living quarters. An extensive account of archaeological resources in the area has been prepared by the University of Texas at El Paso and is entitled, Archaeological Survey in the Southern Tularosa Basin, New Mexico. This survey is not yet published, but a draft is on file with DEH.

The FTBL cantonment area has been in its current location since 1893, and many structures remain from that period. A survey published in 1978 identified buildings onpost older than 50 years and discussed eligibility for the National Register of Historic Places. This survey dismissed all buildings less than 50 years old as ineligible for inclusion on the National Register due to insignificant historical or architectural characteristics (Whalen et al., 1978). The conclusions o this study have been questioned by historians who view World War II structures onpost as significant. A 3-year historical study of the cantonment area is reportedly underway and is expected to identify a number of buildings eligible for inclusion on national and state historical registers.

1.6 ENVIRONMENTAL SETTING

1.6.1 LOCATION

FTBL is situated in the western corner of the state of Texas and extends northward into south-central New Mexico. The cantonment and southern maneuver areas are located northeast of the city of El Paso in El Paso County, Tex. The northern maneuver and range areas are located primarily in Otero County, N. Mex.; the western half of Dona Ana Complex is located in Dona Ana County, N. Mex. Approximately 89 percent of the reservation is located in New Mexico, while the main cantonment area and remaining 11 percent are located in Texas. Fig. 1.6-1 shows the location of FTBL, while Fig. 1.6-2 is a site map showing the general configuration of the installation and its major component areas.

FTBL extends north-northeastward for approximately 112 km and varies in width from 48 to 80 km. The reservation consists of five major land areas: (1) the cantonment area, adjoining the northeastern section of El Paso; (2) Maneuver Areas I, II, and VII, located south of and immediately north of the Texas-New Mexico state line; (3) McGregor Guided Missile Range in Otero County, N. Mex., east of U.S. Highway 54; (4) Dona Ana, Hueco, and Orogrande Complex, west of Highway 54 in Otero

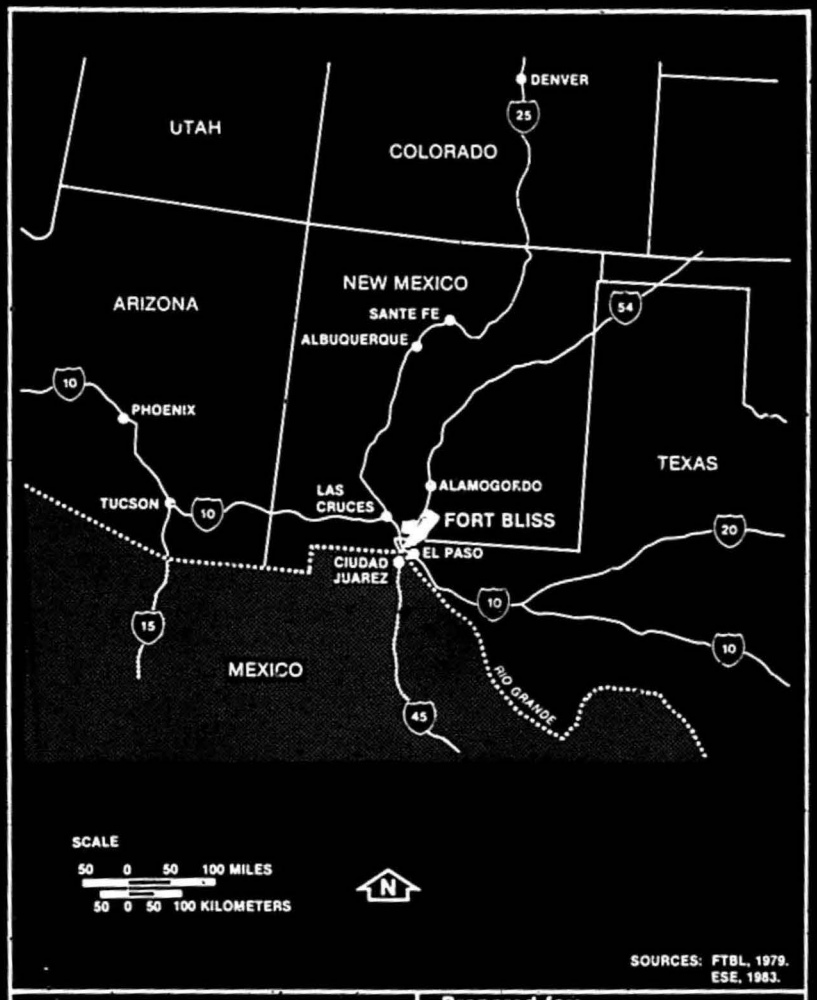
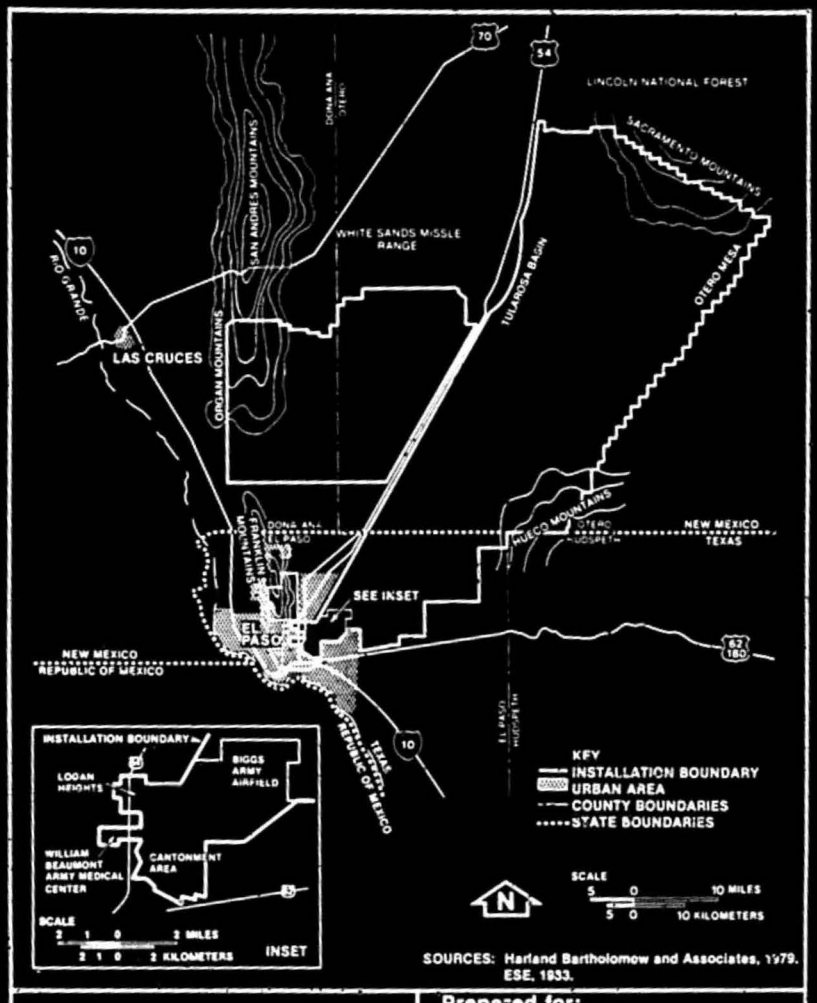


Figure 1.6-1
LOCATION MAP OF FORT BLISS

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland



SOURCES: Harland Bartholomew and Associates, 1979.
ESE, 1983.

Figure 1.6-2
SITE MAP OF FORT BLISS

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

and Dona Ana Counties, N. Mex.; and (5) Castner Range. The latter is a disjunct parcel of land located northwest of the cantonment area at the base of the Franklin Mountains and is no longer used by the Army for training. White Sands Missile Range (WSMR) adjoins the northwestern boundary of FTBL; Lincoln National Forest and the Sacramento Mountains adjoin the northern boundary; and Bureau of Land Management (BLM) and private ranch lands adjoin the eastern, western, and southern boundaries.

1.6.2 METEOROLOGY

The climate of FTBL is characterized by arid, semi-arid desert conditions, with cool nights and hot days (FTBL, 1979; Alvarez and Berckner, 1980) in the summer and cool days and cold nights in the winter. The warmest month is July, which records a mean daily maximum temperature of 35.0 degrees Celsius (°C) (USAETL Terrain Analysis Center, 1978). December is the coldest month, with a mean low temperature of 0.6°C. The recorded temperature is higher than 32.2°C approximately 87 days per year; temperatures measure 0.0°C or lower 34 days each year. Annual rainfall averages 20 centimeters (cm) (FTBL, 1979). The midsummer months receive the greatest amount of rainfall, with an average monthly precipitation of 1.6 cm, and annual snowfall averages 12.7 cm. The annual evaporation rate is 254 cm (FTBL DEH, 1980a). Wind storms are prevalent in March and April, with wind from the north at an average speed of 3.37 meters per second (m/s). Summaries of monthly climatological data are presented in Table 1.6-1.

1.6.3 GEOGRAPHY

Located in eastern Dona Ana and western Otero Counties of N. Mex. and northern El Paso County, Tex., FTBL is situated within the Basin and Range physiographic province of these states. The reservation includes four general topographic zones, each containing characteristic relief and soils:

1. Tularosa Basin--The Tularosa Basin is a broad, relatively flat desert valley lying east of the Organ and Franklin Mountains

Table 1.6-1. Monthly Summaries of FTBL Climatological Data

Month	Temperature (°C) Mean Daily Maximum	Mean Daily Minimum	Extreme Maximum	Extreme Minimum	Precipitation (cm) Mean	Maximum	Minimum	Percent Frequency Surface Wind Speed (>8.2 m/s)
January	13.3	0.0	24.4	-22.8	0.10	0.47	0.00	4.8
February	16.7	2.2	26.7	-12.8	0.10	0.48	0.00	6.7
March	20.0	5.6	31.7	-7.2	0.07	0.57	0.00	11.4
April	25.0	10.6	35.6	-3.3	0.07	0.57	0.00	10.0
May	30.0	15.0	41.1	3.3	0.07	0.49	0.00	5.9
June	35.0	20.0	41.7	10.6	0.12	0.72	0.00	3.2
July	34.4	21.7	41.7	15.6	0.40	1.4	0.01	1.7
August	33.3	21.1	40.6	15.0	0.35	1.1	T	1.1
September	30.6	17.8	39.4	7.8	0.30	1.7	T	0.6
October	25.6	11.7	33.9	1.1	0.17	1.1	0.00	1.3
November	18.3	3.9	28.3	-8.3	0.07	0.64	0.00	2.9
December	14.4	0.6	23.9	-15.0	0.12	1.0	0.00	3.6
No. of Years of Record	21	21	21	21	21	76	85	14

T = Trace.

Source: USAETL Terrain Analysis Center, 1978.

and west of the Sacramento and Hueco Mountains and Otero Mesa (see Fig. 1.6-1). As a result, the valley encompasses the central and eastern sections of Dona Ana Complex, the western section of McGregor Range, and the cantonment and southern maneuver areas. Elevations in the valley areas range from approximately 1,273 meters (m) in the east to approximately 1,197 m in the west. This basin slopes gently to the west and is characterized by low, semistabilized sand dunes.

2. Otero Mesa--Otero Mesa is an area of low to moderate relief, covering most of the central and eastern sections of McGregor Range between the Sacramento Mountains in the north and the Hueco Mountains in the south. The mesa is characterized by a broad, relatively flat, grass-covered surface gently sloping to the east, with a sharp, west-facing escarpment rising steeply from the desert floor; local relief along this front varies from 100 to 242 m.
3. Alluvial Plain--The northern portion of McGregor Range is covered by an alluvial plain of relatively low relief, sloping off the Sacramento Mountains. Similar plains are located in the western portion of Dona Ana Complex, sloping off the Organ Mountains.
4. Mountains--Mountain ranges onpost include sections of the Organ Mountains on the northwestern portion of Dona Ana Complex, Hueco Mountains on the central portion of McGregor Range, Sacramento Mountains on the northeastern corner of McGregor Range, and Franklin Mountains on the western area of Castner Range. Maximum elevations range to 1,727 m above mean sea level (MSL) in the Hueco Mountains, and 2,606 m above MSL in the Organ Mountains, located on the eastern and western areas of FTBL, respectively.

Located in the Chihuahuan Desert biotic zone, FTBL is generally arid. Surface water on the reservation consists of watering tanks supplied by pipelines and by numerous playas, seasonally containing water during

periods of moderate to heavy precipitation. Intermittent streams handle surface runoff during such periods before water dissipates by seeping into the ground or by evaporation. No streams flow off the FTBL reservation.

1.6.4 GEOHYDROLOGY

Geologic Setting

The central portion of FTBL is underlain by unconsolidated alluvial deposits of Cenozoic age, which are composed of sands, clays, gravels, and caliche. Igneous and sedimentary bedrock of Permian, Pennsylvanian, and Cretaceous ages underlies the entire installation and outcrops on the eastern and western portions of the site. The bedrock is composed of granites, limestones, and dolomites (Fig. 1.6-3). A cross section of the installation (Fig. 1.6-4) shows that the contact between the overlying alluvium and bedrock forms a wedge of alluvium, with the depth to bedrock ranging from 0 to 2,743 m on the eastern and western perimeter of the central section of the installation (USAETL Terrain Analysis Center, 1978).

The structural geology of the area is complex, including drop-faulted basins and block-faulted mountains (USAETL Terrain Analysis Center, 1978). The installation is located in an area of moderate seismic risk (FTBL, 1979).

Soils

Soils at the installation are comprised of silt and sand loam, gravelly loam, and fine sands and silt. The soils originate from weathering of the limestones and granites of the mountains, with some eolian intrusion. Except for areas composed of bedrock or underlain by caliche layers, the soils are calcareous and alkaline, with moderate permeability, and are moderately well drained.

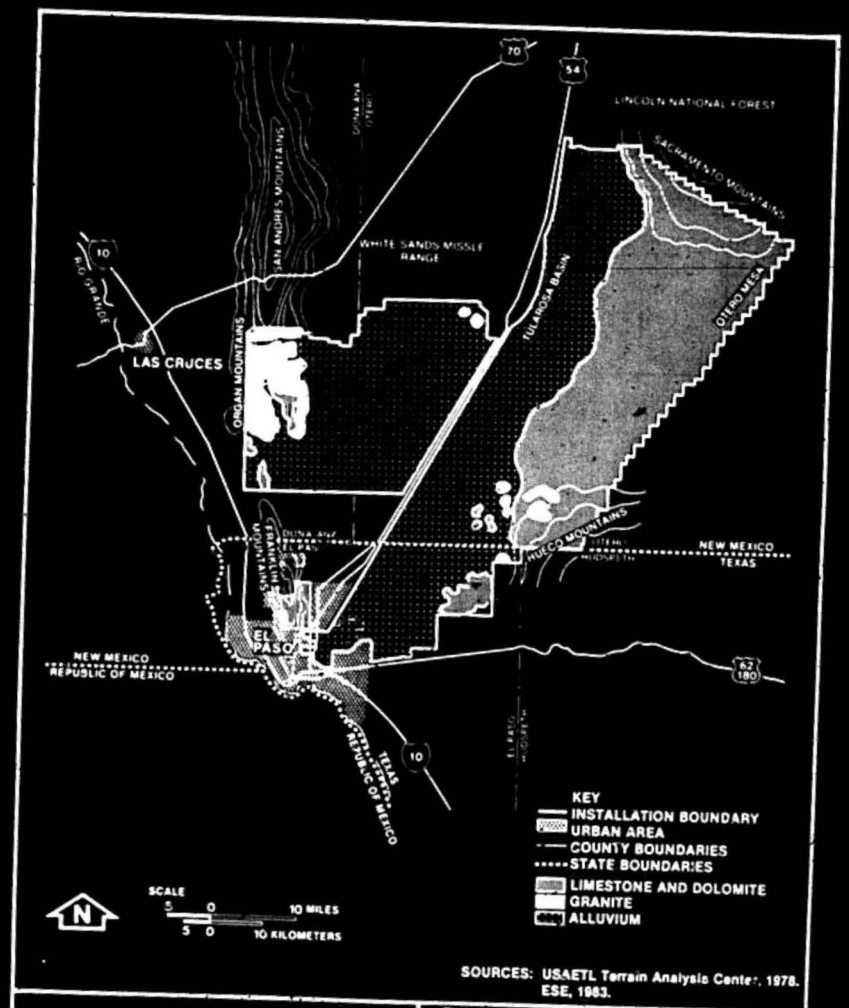


Figure 1.6-3
GEOLOGIC MAP OF FORT BLISS

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

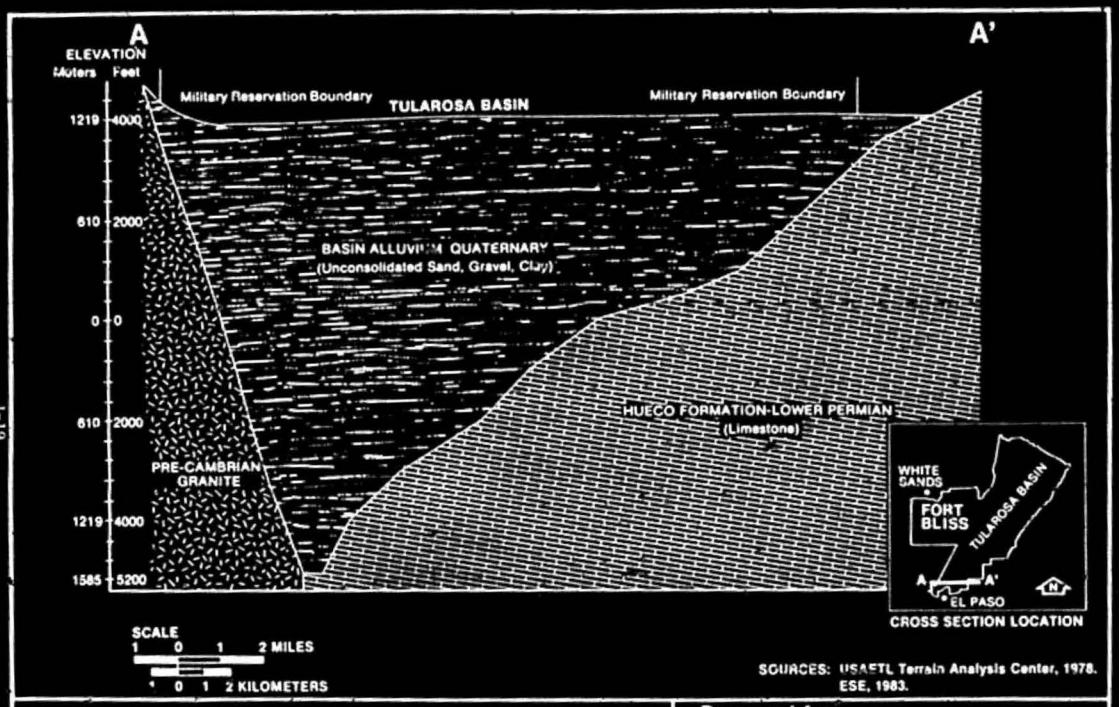


Figure 1.6-4
GEOLOGIC CROSS SECTION THROUGH FORT BLISS

Prepared for:
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Aberdeen Proving Ground, Maryland

Ground Water

Two water table aquifers occur in the vicinity of FTBL: the Rio Grande alluvium aquifer and the Hueco Bolson aquifer. The installation is situated over the Hueco Bolson aquifer, which is a wedge-shaped aquifer in the unconsolidated sediments overlying the bedrock. The Hueco Bolson aquifer is primarily a brackish-water aquifer, with a lense of fresh water floating on its surface in the southwestern corner (FTBL DEH, 1981) and provides up to 7,572 liters per minute (lpm) of potable water. Most of the runoff from the mountains infiltrates the coarse gravel alluvial fans near the mountains, thereby recharging the aquifer. Very little recharge occurs in other areas of the basin due to the caliche, which forms a nearly continuous layer beneath the surface of the basin. The near-surface caliche bed averages 0.15 to 1.2 m in thickness (FTBL DEH, 1981), with some areas as thick as 2.0 m. Beds of caliche are also interlayered with beds of other materials. The caliche beds are somewhat fractured in places and are absent near the mountains.

Water table elevations are declining; the Hueco Bolson aquifer is currently being pumped at a greater rate than the rate at which it is being recharged. Ground water generally flows southwesterly. Depth to water ranges from 78 to 105 m below land surface (Anonymous, 1982).

Not necessarily drinking water

Wells

More than 70 abandoned wells exist on FTBL; many of these were constructed to explore for water and oil. Seventeen operational water supply wells currently exist on FTBL (Fig. 1.6-5). Most of these supply wells are placed 0.6 km apart to minimize the cone of depression from pumpage and reduce the infiltration of poor quality water from over pumpage. Well data for water supply wells are presented in Table 1.6-2, while Table B-1, App. B, contains additional physical data.

1.6.5 BIOTA

FTBL is located in the northern Chihuahua Desert biotic zone, a region characterized by sandy soils and arid conditions. However, significant

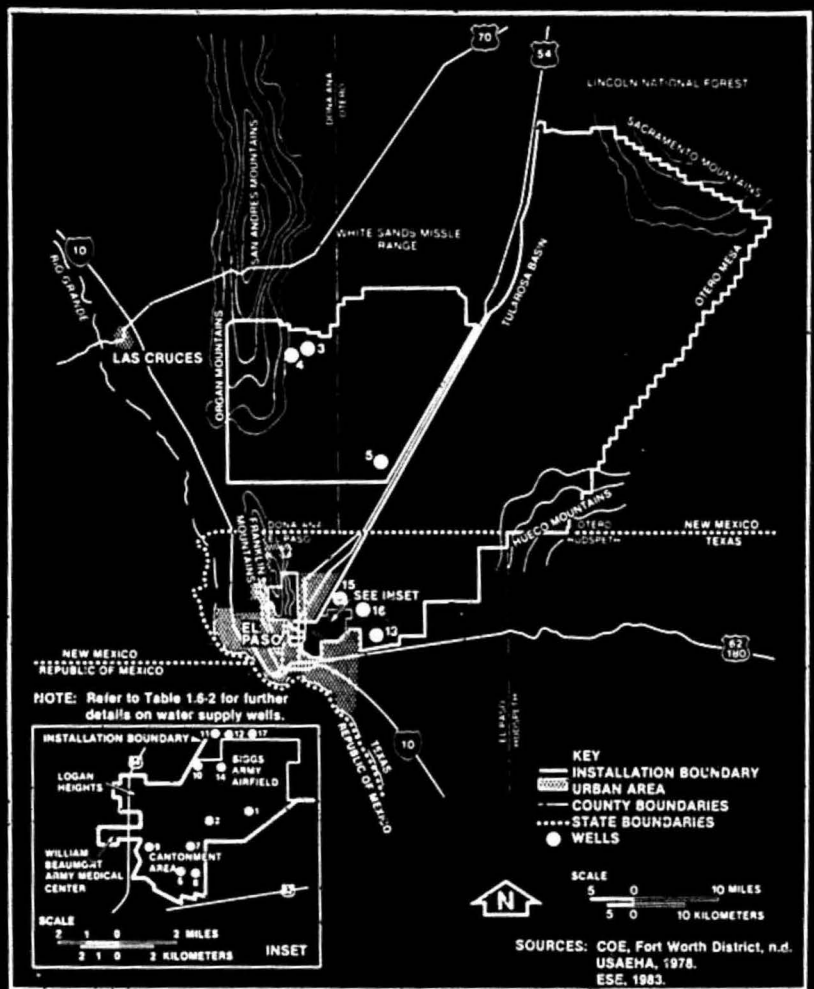

Figure 1.6-5
LOCATIONS OF WATER SUPPLY WELLS ON FORT BLISS

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U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Table 1.6-2. Water Supply Wells on FTBL

Well No. (see Fig. 1.6-5)	Water Elevation Static (m)	Pumped (m)	Drawdown (m)	Remarks
1	302	363	61	Bldg. 11241; Biggs Area Well 1A; FTBL Well 1A
2	340	--	--	Bldg. 11183; Biggs Area Well 2A; FTBL Well 2A
3	--	--	--	Bldg. 8299; Dona Ana Target Range Well 2
4	--	--	--	Bldg. 8101; Dona Ana Target Range Well 3
5	--	--	--	Hueco Firing Point Well 3
6	270	348	78	Bldg. 1170; FTBL Well 5
7	360	333	33	Bldg. 1252; FTBL Well 6
8	300	322	22	Bldg. 2451; FTBL Well 7
9	276	342	66	Bldg. 1315; FTBL Well 9
10	274	319	45	Bldg. 3696; FTBL Well 10
11	255	288	33	Bldg. 3697; FTBL Well 11
12	305	330	25	Bldg. 3698; FTBL Well 12
13	--	--	--	Bldg. 6911; unnumbered well
14	296	324	28	Bldg. 3699; FTBL Well 13
15	325	--	--	Bldg. 3796; FTBL Well 14
16	325	372	47	Bldg. 3797; FTBL Well 15
17	330	370	40	Bldg. 3798; FTBL Well 16

--.= Not available.

Sources: U.S. Army Corps of Engineers (COE), Forth Worth District, n.d.
USAFHA, 1978.
ESE, 1983.

differences in amounts of annual rainfall at different altitudes (i.e., topographic areas) allow several vegetation associations or plant zones to occur on the reservation. Five distinct zones have been identified and mapped, including a sand dune-mesquite zone, alluvial fan-creosote bush zone, foothills and draw yucca grassland zone, mesa grassland zone, and mountain canyon-pinyon and juniper zone (USAEHA, 1975).

Sand dune-mesquite and alluvial fan-creosote bush zones are the most drought-resistant and widely distributed associations and occur in the Tularosa Basin areas of FTBL. Mesquite (Prosopis glandulosa) and sage brush (Artemisia sp.) are the characteristic species of sand dune habitat, along with sand yucca (Yucca elata), dropseeds (Sporobolus sp.), saltbush (Artiplex sp.), and broom snakeweed (Xanthocephalum sp.). The alluvial fan-creosote bush zone also occurs on the alluvial fans of the Hueco, Organ, and Sacramento Mountains and on areas of shallow soils overlying caliche. Creosote bush (Larrea tridentata), tarbush (Flowrensia sp.), broom snakeweed, yucca, and whitethorn (Acacia constricta) are characteristic species in this plant zone. Several riparian species occur along arroyos which dissect this zone (FTBL, 1979).

Plant compositions in the foothill and draw-grassland and mesa-grassland zones are dominated by grasses, particularly gamma (Boutelona spp.) and three-awns (Aristeda spp.). Shrub diversity is high in the yucca-grassland association and low in the mesa-grassland zone. Yucca-grassland associations occur in large draws of the Hueco Mountains and on rolling land west of the Otero Mesa escarpment. The mesa-grassland association occurs on the Otero Mesa north and east of the draw and foothills grassland zone.

The mountain canyon-pinyon and juniper zone contains pinyon (Pinus edulis) and juniper (Juniperus spp.) as characteristic canopy species, along with mountain mahogany (Cercocarpus sp.), agave (Agave parryi),

oaks (Quercus spp.), sotol (Dasylirion sp.), and sumac (Rhus spp.); ponderosa pine (Pinus ponderosa) and aspen (Populus sp.) occur at higher elevations. Pinyon-juniper associations on FTBL occur in the Organ and Sacramento Mountains and include onpost portions of the Lincoln National Forest.

The onpost distributions of mesquite, creosote bush, yucca and mesa grasslands, and pinyon-juniper zones on FTBL are shown in a general vegetation map in the installation draft environmental impact statement (DEIS) (FTBL, 1979). A detailed discussion of plant species compositions, complete with species lists, successional patterns, and historical changes in onpost vegetation communities, is provided in the 1975 USAEHA ecological analysis of McGregor Range (USAEHA, 1975).

The presence and distribution of wildlife species on FTBL are related to the presence and onpost distribution of suitable wildlife habitat. Due to arid conditions, absence of permanent surface water, and open spacing of shrubs, wildlife diversity is lowest in the sand dune-mesquite zone for birds and mammals. The ecological survey of McGregor Range (USAEHA, 1975) recorded only 2 mammal species, 18 bird species, and 3 reptile species. In contrast, onpost plant zones supporting denser ground cover (e.g., grasslands) or several vegetation strata (e.g., pinyon-juniper woodlands) contain higher wildlife diversities. Grassland, creosote bush, and pinyon-juniper zones each supported 5 mammal species, up to 36 bird species, and 5 reptile species (USAEHA, 1975). As a result, wildlife diversity over much of FTBL, including almost the entire Tularosa Basin area, is relatively low. Wildlife species diversities are highest in the alluvial fan and mountain woodland habitats.

FTBL supports several species of commercial and recreational importance. Game mammals include black-tailed jack rabbit (Lepus californicus), mule deer (Odocoileus hemionus), white-tailed deer (O. virginianus), and pronghorn (Antelocarpa americana). Species of commercial importance

include badger (Taxidea taxus), gray fox (Urocyon cinereoargenteus), and coyote (Canis latrans). The observed bird composition consists primarily of songbirds and lesser numbers of raptors, quail, doves, owls, and other species. The recorded onpost herpetofauna includes six species of lizards and three species of snakes (USAEHA, 1975). Wildlife species occurring or expected to occur on FTBL are listed in the 1975 USAEHA survey (USAEHA, 1975) and installation DEIS (FTBL, 1979).

No Federally listed endangered plant species have been located on FTBL during past environmental surveys (FTBL, 1979).

1.7 LAND USE

1.7.1 LEASES AND AGREEMENTS

FTBL currently consists of about 450,306 ha of land, 47,841 ha being in Texas and 402,465 ha in New Mexico. Of this, 94,083.8 ha are owned in fee by the Army. The remaining 356,223 ha consist of land leased by the Army from the State of Texas (6,864 ha in Maneuver Area II), U.S. Forest Service land used under a memorandum of agreement with the U.S. Department of Agriculture (USDA) (7,286 ha in McGregor Range), and land withdrawn from public domain for training purposes (342,073 ha in the Dona Ana, Hueco, Orogrande Complex and McGregor Range). These acreages are further identified in App. C.

FTBL has granted a number of outgrants (easements, permits, licenses, leases) to Government and private agencies for use of building space and rights-of-way for utilities lines and transportation accesses. Outgrants of interest from the standpoint of toxic/hazardous materials include a license held by the New Mexico National Guard for training on 32.6 ha south of the Dona Ana Range Camp (includes the operation of tanks, repair shops, and a motor pool) and a permit held by the USAF for use of buildings and facilities for operational maintenance and operation of a weather station at BAA. Ford Aerospace holds a lease for land at North McGregor Range on which it plans to construct an ammunition test facility sometime in the future. Until November 1982,

the U.S. Marine Corps (USMC) had a permit to operate a motor pool at Logan Heights, but the permit was terminated at that time and the USMC moved motor pool operations to a Naval motor pool west of the North-South Freeway and south of Fred Wilson Ave. BLM grazes livestock on portions of McGregor Range under a memorandum of understanding with the Army. All outgrants currently in effect on FBL are listed in App. C.

1.7.2 EXCESSING ACTIONS

Land status has changed significantly throughout the history of FTBL through both acquisitions and excesses, as well as changes in land use agreements. Major acquisitions are outlined in Sec. 1.5.1. Two significant excesses from FTBL have occurred. The first involved a parcel of land in the southern portion of WSMR, which was transferred from FTBL in 1952. It had been used during World War II as an antiaircraft range and for ordnance testing by the Ordnance California Institute of Technology (ORDCIT).

The second excess of significance involved Castner Range, an area to the west of the main cantonment area and adjoining the city of El Paso. This range area was originally 3,359 ha, but in 1966, a right-of-way over 485.6 ha was granted to the city of El Paso for the Transmountain Highway and the North-South Freeway. Construction commenced, following appropriate surface clearing of the area for unexploded ordnance (UXO). The remaining area was declared excess in 1972. Reportedly, the General Services Administration (GSA) agreed to accept the parcel for disposition, provided the area was cleared properly. The land was not and has not been cleared; therefore, it remains in the custody of FTBL until clearing operations take place. The area is posted with signs warning against UXO.

A sizeable parcel of land adjoining Maneuver Area II was used during World War II and thereafter by FTBL for maneuver operations under lease

agreements. This area has been returned to the original owners (see Sec 1.5.1).

1.7.3 ADJACENT LAND USE

The city of El Paso lies to the south and west of the FTBL cantonment area and BAA and characterizes the area as urban, with residential, commercial and light industrial, heavy industrial, and recreational areas. Further to the south across the Rio Grande River is Juarez, Mex., a heavily industrialized city which contributes to poor regional air quality. The El Paso airport adjoins BAA to the south. Land areas to the east, north, and west of the cantonment area contrast sharply with the urban character of El Paso. To the east and northeast into New Mexico, the terrain is sandy plains, used primarily for ranching by private land owners. To the north lie the Sacramento Mountains and Lincoln National Forest. WSMR adjoins FTBL north of Maneuver Areas VI and VII and to the northwest and west, respectively, are the San Andres, Organ, and Franklin Mountain Ranges.

1.8 LEGAL CLAIMS

Two legal claims relating to toxic/hazardous materials reportedly have been made against FTBL. In 1974, the guidance system of a missile being tested at McGregor Range failed, and the missile crossed installation boundaries and landed (unexploded) in a nearby resort area. Several claims were made for broken windows, shifted housing structures, injuries from broken glass, etc. The only claim which reached court was by the owner of the resort property, who claimed the incident discouraged potential homeowners and resulted in substantial loss of income. The court ruled in favor of the claimant and assessed $350,000 in damages against the Army.

In 1974-1975, the Army was required to pay $25,000 in damages following the death of an individual performing range clearing operations. Reportedly, the individual was an illegal alien employed by a contractor on FTBL.

In addition to these, a local resident has complained that the daily firing of the FTBL ceremonial canon exceeds permissible noise levels. Investigations showed noise levels to be in compliance with applicable guidelines (see Sec. 2.4.4).

2.0 PAST AND CURRENT ACTIVITY REVIEW

2.1 INSTALLATION OPERATIONS

2.1.1 INDUSTRIAL OPERATIONS

Maintenance and repair of vehicles and aircraft are the primary industrial operations conducted at FTBL. These functions are performed by DIO, DEH, DPCA, and various military units at approximately 35 separate locations (Table 2.1-1). Due to the extent of these maintenance operations, they are discussed initially in a general sense, rather than by specific location.

Vehicle maintenance performed includes direct support/general support (DS/GS) and organizational-level operations. Specific tasks conducted include oil and lubricant changes, cleaning, degreasing, battery repair, radiator servicing, brake repair, tuneups, component rebuilding, transmission repair, painting, parts machining, and engine rebuilding. Equipment maintained includes 700 commercial vehicles (cars, pickup trucks, and buses), 680 combat vehicles (personnel carriers, tanks, and missile launchers), and 3,640 tactical vehicles (trucks, jeeps, tractors, and trailers).

Organizational-level aircraft maintenance is performed by the 3d ACR and various other military units located in hangar facilities at BAA. Operations include component degreasing, parts changing, aircraft washing, radio repair, and routine maintenance (i.e., oil changes). The number of aircraft maintained fluctuates with unit transfers and currently is reported to be approximately 60 helicopters.

DEH conducts general building maintenance activities. Painting operations, located in Bldg. 1124, use spray and brush application on items such as road barricades and signs. This building is equipped with

Table 2.1-1. FTBL Motor Pools/Vehicle Maintenance Shops

Directorate/Unit	Building
3d ACR	
Air Cavalry Troop	11048
1st Squadron	
HQ	2932
A,B Troop	2941
C Troop, D Company	2931
2d Squadron	
HQ, H Company	2984
E, F, G Troop	2994
Howitzer Battery	2992
3d Squadron	
HQ, Howitzer Battery	2971
I, L Troop	2961
K, M Troop	2962
43d Engineer Company	2667
66th Military Intelligence Detachment	11315
407th ASA Company	11315
513th Maintenance Company	2661
11th ADA Brigade	
HQ and HQ Battery	2674
1st Battalion 7th ADA	
HQ, HQ Battery, A Battery	2431
B Battery	2680
C Battery, D Battery	2423
1st Battalion 65th ADA	
HQ, HQ Battery	2674
A, B, C, D Battery	2680
2d Battalion 55th ADA	
HQ, HQ Battery	2674
A, B, C, D Battery	2466
4th Battalion 1st ADA	
HQ, HQ Battery	11046
A, B Battery	11047
C Battery	11142
D Battery	11179

Table 2.1-1. FTBL Motor Pools/Vehicle Maintenance Shops
(Continued, Page 2 of 2)

Directorate/Unit	Building
USAADS	
1st Battalion 55th ADA	
HQ, HQ Battery	2925
A, B, C, D Battery	2922
2d Battalion 52d ADA	
A, B, C, D Battery	9521
5th Battalion 57th ADA	
HQ, A, B Battery	1056
70th Ordnance Battalion	
13th Ordnance Company	2764
52d Engineer/D Company	1067
62d Transportation Company	2478
118th Ordnance Detachment	898
553d Field Service Company	1050
2d Platoon 507th Medical Company	11224
DEH	1073
DIO	
Commercial Vehicles	1334
Heavy/Special Equipment	2529
Combat Vehicles	2588
Component Repair	2515
DPCA	
MSA Division	
Automobile Craft Shop (BAA)	11189
Automobile Craft Shop (FTBL)	820

HQ = Headquarters.
ASA = Army Security Agency.
MSA = Morale Support Activity.

Source: ESE, 1983.

a liquid-curtain spray booth. Interior and exterior painting of buildings is performed by contractors. The carpenter shop, also located in Bldg. 1124, performs minor structural alterations and repair of office area furniture. Minor maintenance of DEH vehicles, including oil changes and tuneups, is performed in Bldg. 1073. Other DEH shops are metal (Bldg. 1118), plumbing (Bldg. 1118), and electric (Bldg. 1288).

DIO Materiel Readiness Division (MRD) operates several shops providing specialized maintenance for equipment other than vehicles. The missile system repair shop in Bldg. 2588 provides repair and overhaul services for guidance and navigation equipment used in various missile systems, including Nike and Hawk. Bldg. 2588 also houses the communication and electronics shop, which repairs field communications gear such as teletypes and radio telephones. The small arms repair shop in Bldg. 2511 provides minor repair of rifles and handguns. This shop contains cleaning and plating tanks intended for refinishing weapons, but this equipment has reportedly been idle since at least 1965 and, reportedly, may never have been in operation.

The DIO Training Aids Support Center (TASC) operates photographic processing shops in Bldgs. 11236 and 11115.

DPCA operates two small automobile craft shops onpost. One is located on BAA at Bldg. 11189 and the other in the cantonment area at Bldg. 820.

2.1.2 LESSEE INDUSTRIAL OPERATIONS

The largest lessee industrial operation is the missile maintenance program operated by Raytheon. The operation comprises different tasks in three areas of FTBL. Facilities in the 1600 block area are used for assembly and checkout of electronic equipment used in monitoring missile test firings. Several hangar areas are used for maintenance modification and refurbishing of missiles, including Hawk and Patriot. Bldgs. 3700 to 3716 in the Tobin Wells area are used for checkout and

testing of major system components prior to shipping missiles to customers.

Intermediate-level aircraft maintenance is performed by Hawthorne Aviation, which uses Hangar 11108 under a contract arrangement. This operation includes fluids changes, parts changes, mechanical repair, spot painting, testing, and battery repair. In addition to supporting military units, this facility repairs aircraft belonging to other Government agencies, such as U.S. Customs and the Border Patrol.

2.1.3 LABORATORY OPERATIONS

Laboratory operations at FTBL include the Preventive Medicine (PVNTMED) Activity water analysis laboratory, the oil analysis laboratory, the hospital and veterinary laboratories, and the photographic laboratories.

The PVNTMED water analysis laboratory conducts medical surveillance of the potable water supply for coliform bacteria and residual chlorine. Liquid waste from the laboratory, located in Bldg. 118, is discarded to the sanitary sewer.

The oil analysis laboratory, located in Bldg. 111, generates approximately 11 liters (l) of trichlorofluoroethane, 91 l of trichlorofluoroethylene, and 3 l of chromic acid per year. In addition, the laboratory generates lesser quantities of sulfuric acid, hydrochloric acid, toluene, potassium iodide, pentane, heptane, phosphoric acid, and alcohols. These reagents, mixed with oil, are discarded into a drum located outside Bldg. 111. When the drum is full, it is sent to the fire department, which reportedly burns the contents as part of training exercises. The laboratory has been in operation since 1982. Since several of these waste reagents are classified as hazardous wastes, this disposal practice is in violation of Resource Conservation and Recovery Act (RCRA) (EPA, 1982b) regulations for hazardous waste disposal. Furthermore, this practice presents a safety

risk to firefighting personnel who are unaware of the hazardous constituents mixed with the waste oil.

The WBAMC laboratory generates a variety of waste reagents. The quantities generated and means of disposal are summarized in Table 2.1-2.

The veterinary clinic, located in Bldg. 2010, discharges very small quantities of waste reagents into the sanitary sewer. Waste fixative solutions from the X-ray unit are sent to WBAMC for silver recovery.

The MSA photographic laboratory, located in Bldg. 11264, generates small quantities of fixative. The solutions are discharged into the sanitary sewer system without silver recovery. These spent solutions should be included in the silver recovery program with the other photographic solutions, in accordance with DOD policy and procedures (DOD, n.d.). The laboratory has been located in Bldg. 11264 since at least 1965.

Seven silver recovery units in the hospital are used to recover silver from waste photographic fixative solutions. Problems have been encountered in the operation of the recovery unit located on the second floor of the hospital, resulting in spillage onto the carpet. Plans are being made to replace this unit. Silver is also recovered from all of the fixative solutions generated by DENTAC. A silver recovery unit has been operated by the TASC Photographic Branch in Bldg. 11236 since 1966. In all instances, the solutions are discharged to the sanitary sewer system after silver recovery.

2.1.4 MATERIEL PROOF AND SURVEILLANCE TESTING

USARADBD is the primary agency conducting, supervising, and evaluating developmental tests (DTs), operational tests (OTs), and concept evaluations for air defense materiel on FTBL. The mission and functions

Table 2.1-2. Wastes Generated by the WBAMC Laboratory

Waste	Quantity Generated Per Month*	Means of Disposal
Acetone†	303	DPDO
Formaldehyde	76	DPDO
Phenol	0.1	Sanitary sewer
Methanol	13	DPDO
Benzene	0.1	Sanitary sewer
Osmium tetroxide	0.0003 kg	Sanitary sewer
Toluene	1	Sanitary sewer
n-Butyl alcohol	0.05	Sanitary sewer
Arsenic	0.10 kg	Sanitary sewer
Potassium cyanide**	0.03	Sanitary sewer
Sodium azide**	0.9	Sanitary sewer
Thiosemicarbizide**	4	DPDO
Cresols	14	DPDO
Hydrazine	1.9	DPDO
Naphthalene†	0.05	Sanitary sewer
Trichlorofluoromethane	4	Evaporation
Acetonitrile	2.8	Sanitary sewer
Aniline	1	Sanitary sewer
Chloroform	9	DPDO
Formic acid	0.05	Sanitary sewer
Pyridine	0.1	Sanitary sewer
Quinones	4	DPDO
Tetrachloromethane	0.2	Sanitary sewer
Potassium ferrocyanide**	0.2	Sanitary sewer
Cyanmethemoglobin	0.1	Sanitary sewer
Mercuric salts	0.01 kg	Sanitary sewer

* Quantities are given in liters, unless indicated otherwise.
† Includes quantities generated by DPCA, Bldg. 58.
** Concentration not specified.

kg = kilograms.

Source: FTBL DEH, 1983.

of USARADBD are listed in its 1981 Organization and Functions Manual (USARADBD, 1981).

The mission and major functions of USARADBD are established by TRADOC. Some DTs are tasked by the U.S. Army Test and Evaluation Command (TECOM), and OT plans are devised by the U.S. Army Operational Test and Evaluation Agency (USAOTEA). USAOTEA devises OT plans as tasked by the Department of the Army (DA), and USARADBD conducts such OTs. The USARADBD Test Division reviews test plans, test results, and test reports as part of its mission (USARADBD, 1981), including DA and civilian contractor tests.

Test programs conducted or supervised by USARADBD are summarized by the board in Monthly Significant Action Reports. These reports, available from USARADBD, announce current and upcoming test activities and provide brief summaries of tests. Relatively few DTs are conducted at FTBL, and only one (DT-1) has been conducted by USARADBD since 1979. This DT-1 is conducted on the 40-millimeter (mm) XM247 ADA gun (Sgt. York) at North McGregor Range.

Almost all test programs supervised by USARADBD are conducted at North McGregor Range, where the board has priority use. The remaining tests are conducted at Dona Ana Range 46. DTs and OTs conducted at these test ranges involve high-explosive (HE) and inert artillery rounds and JP-4 fuel. Inert and HE artillery rounds include standard and experimental rounds. JP-4 fuel is spilled on McGregor Range as a result of drones and aircraft (e.g., F-86 Sabre Jet, MQM34D, QH-50, QUH-1) shot down over the impact area. The total amount of fuel spilled in the impact area per annum is not known, but most fuel is expected to burn up on impact. North McGregor Range is used by USARADBD for testing of systems requiring a large firing fan. Dona Ana Range 46 is used for air defense weapons testing requiring shorter firing ranges. The 81st Chemical Detachment provides smoke (pots and diesel generating) as required in

support of testing to simulate combat environments at North McGregor Range and Dona Ana Range 46.

The missions and test activities of USARADBD are covered by the FTBL DEIS. However, USARADBD will prepare or provide information to prepare environmental assessments (EA) for larger test programs. When an EA is not required, the board prepares categorical exclusion statements (ES) and other environmental clearance documents with the concurrence of the post Environmental Protection Office (EPO).

In addition, USARADBD prepares annual Hazardous Waste Inventory reports for submittal to EPO. These reports list waste inventories from board activities and state where such items are used, how they are generated, and where they are disposed of for all test programs. Based on the Hazardous Waste Inventory for 1982, the USARADBD generated 189.5 l each of solvents and motor oil each month, which were stored in Bldg. 1655 prior to disposal by a contractor.

The USAADS Test and Evalution Division has not conducted DTs or OTs at FTBL to date. Similarly, no DT or OT testing has been conducted to date by the Joint Forward Air Defense Test Directorate, which is tasked by the Office of the Secretary of Defense (OSD). The DARCOM LOA at FTBL is not responsible for conducting tests or administering contracts. The primary mission of LOA is to supply and maintain specialists to provide technical assistance to the Air Defense Center, USAADS, and various tenant activities on FTBL. The mission and responsibilities of DARCOM LOA are listed in TRADOC Regulation 10-1 (DARCOM LAO, n.d.).

The FTBL DPT administers a Test and Evaluation Division, which performs evaluations of United States and Allied Nike, Improved Hawk, and Chaparral air defense units conducting annual service practice at McGregor Range. The Test and Evaluation Division also performs all

maintenance requirements, provides operators for target simulator equipment, and provides technical assistance, firing supervision, and safety monitoring for Army Training and Evaluation Program (ARTEP) field firing of Nike, Hawk, and Chaparral missiles. The DPT Test and Evaluation Division does not conduct DT or OT testing. Wastes generated during the division's test programs include unknown quantities of solid propellant, fuel, and powder on the McGregor Range. The DPT Test and Evaluation Division does not prepare an Annual Hazardous Waste Plan.

2.1.5 TRAINING AREAS AND ACTIVITIES

FTBL served primarily as a cavalry post until 1942, when it became a center for antiaircraft artillery training. The installation became the U.S. Army Air Defense Center on July 1, 1957. Currently FTBL is the home of the Headquarters, U.S. Army Air Defense Center.

The mission of FTBL is to maintain assigned Strategic Army Forces (STRAF) units at a readiness condition; train and deploy Active Army, National Guard, Army Reserve, and Reserve Forces Act personnel in accordance with current directives; coordinate and support the execution of annual service practice for air defense units and, when required, surface-to-surface units as directed by TRADOC/FORSCOM. In addition, FTBL trains air defense units for North Atlantic Treaty Organization (NATO) and other Allied Nations; commands, trains, and provides support for all FTBL FORSCOM units; and operates AAA (FTBL, 1982b). The primary field training mission of FTBL is the training of Active Army, reserve components, and the Allied Forces in air defense and artillery tactics and systems, including guided missiles and antiaircraft artillery.

Training activities on FTBL include field training exercises (FTXs) employing troops, equipment, and vehicles in tactical situations; missile and artillery firings; aerial gunnery training; air support operations; and other activities related thereto. FTBL also operates the 1st ADA Brigade, which provides basic combat training; advanced

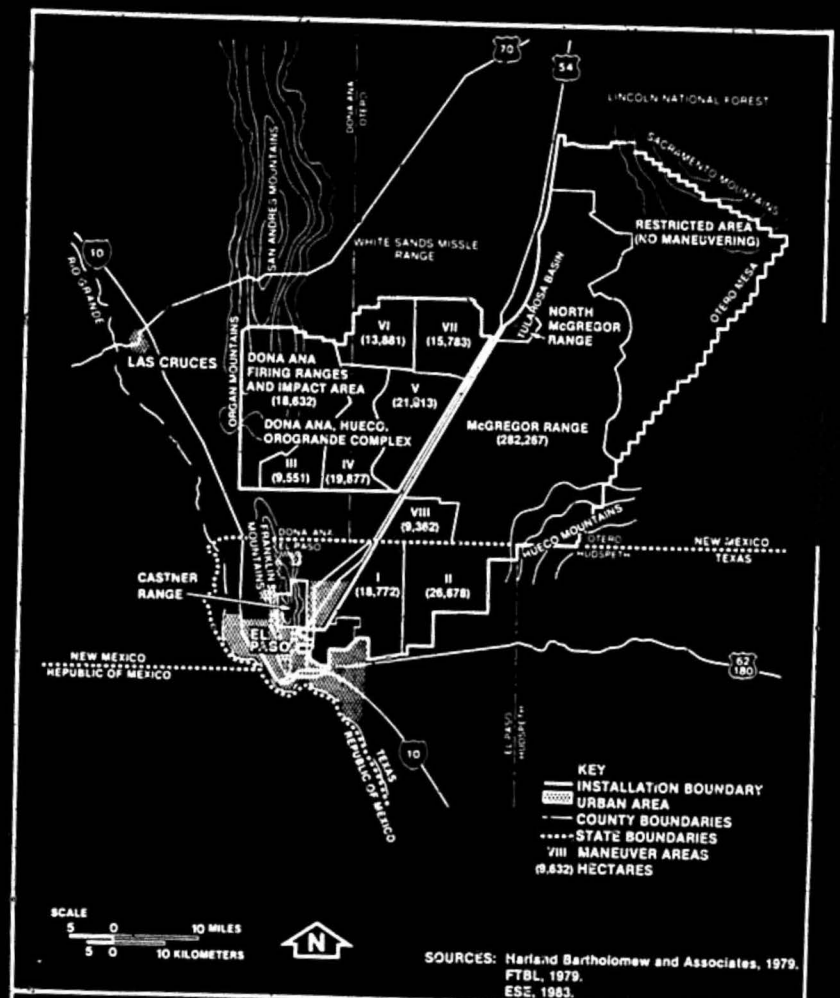
individual training to support air defense systems; Redeye gunner training; and maintains and supports the Improved Hawk, Nike Hercules, ADA automatic weapons (M-12, M-55), Redeye, and Chaparral/Vulcan, among others.

FTXs conducted at FTBL include:

1. 3d ACR quarterly ARTEPs at Dona Ana Range;
2. Reserve component training in field artillery, tank gunnery, and air defense;
3. Annual service practice, including missile firing for foreign units, includes familiarization/certification firing of Nike Hercules and Hawk;
4. Airborne operations (e.g., Dragon Team 1982); and
5. Joint training exercises (JTXs), the largest of which was Border Star 1981, which involved 27,000 troops. Environmental impact assessments (EIAs) have been prepared for such large-scale training and maneuver exercises (e.g., FTBL DEH, 1980b).

Field training at FTBL is conducted in eight maneuver areas and at numerous firing ranges (see Sec. 2.1.6). Close-in maneuver areas include MA-1, MA-2, and MA-8, and are located between the cantonment area and McGregor Range. MA-3 through MA-7 are located on the Dona Ana-Hueco-Orogrande Complex. Locations and relative sizes in hectares for MA-1 through MA-8 are shown in Fig. 2.1-1. Each maneuver area is subdivided into several subareas (e.g., MA-2A through MA-2E), which are listed and mapped in the FTBL Range Command Standing Operating Procedures (SOPs) for Weapon Firing and Maneuver Area Use (FTBL Range Command, 1982; FTBL Range Command, 1981b).

FTBL contains 133,559 ha available for maneuvering. Utilization of this area averaged 718 battalion-days for the 6-month period of July 1-Dec. 31, 1982. This estimate does not include additional utilization by company-, battery-, and detachment-sized units. In fiscal year (FY)



SOURCES: Harland Bartholomew and Associates, 1979.
FTBL, 1979.
ESE, 1983.

Figure 2.1-1
TRAINING AREAS AND RANGES ON FORT BLISS

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

1980, maneuver area usage of MA-1 through MA-8 was scheduled to be 320,000 troops; Dona Ana Ranges 40 through 54 were scheduled to support 140,000 troops; and McGregor firing ranges were scheduled to support 18,000 troops (FTBL, 1978).

Additional field training facilities include drop zones, terrain flying areas (TFAs), and two gas chambers. Five drop zones (Old Coe Lake, Desperation, Stewart, Wesley Wells, and Tularosa) are located in the Dona Ana, Hueco, Orogrande Complex. Four TFAs are established for nap-of-the-earth (NOE) flight training. TFA-1 is located on the Dona Ana, Hueco, Orogrande Complex and overlies manuever areas MA-3 through MA-7. TFA-1 is used for low-level and contour flights. TFA-2, TFA-3, and TFA-4 are located within the McGregor Range. TFA-2 is used for low-level, contour, and NOE flights and overlies the central section of McGregor Range. TFA-3 and TFA-4 are used for low-level and NOE flights and overlie the southern and northern sections of McGregor Range. The locations of FTBL TFAs are shown in FTBL Range Command (1982).
Nuclear, biological, and chemical (NBC) chambers at FTBL are located at Myer Small Arms Range and at Dona Ana Range at Coe Lake. FTXs range from basic combat training to large-scale JTXs.

Close air support during major exercises is scheduled by DPT Range Branch and the 3d Armored ACR. A variety of high-performance aircraft (A-7, T-38, F-105, F-15, F-111) are assigned by the 12th USAF Tactical Airlift Command at Bergstrom AFB, to deliver bombs [25 pounds (lb) or larger] and 20-mm fire during live-fire exercises. In addition, the 479th Tactical Fighter Wing, Holloman AFB, N. Mex., conducts aerial maneuvers over McGregor and Dona Ana ranges under an ISSA.

2.1.6 RANGES

FTBL contains a variety of small arms, artillery, mortar, grenade, surface-to-air, and air-to-ground firing ranges to serve its training and testing requirements. Troop maneuvering and range firing at all ranges are under the control of FTBL Range Command, which operates,

maintains, allocates, and schedules use of McGregor Range, Dona Ana Range Camp, Orogrande Range Camp, Meyer Small Arms Range, and all firing facilities (FTBL, 1978). The FTBL DPT Range Branch is responsible for scheduling airspace over the reservation and USAF activities at FTBL.

Three primary firing ranges are located on FTBL, including the Meyer Range Complex, Dona Ana Range Complex, and McGregor Range Complex. Additional firing ranges include air-to-ground and demolition ranges.

1. Meyer Range Complex--Meyer Range is located east of U.S. Highway 54 and north of the Texas-New Mexico state line, approximately 45 km northeast of the FTBL cantonment area. Firing ranges and NBC facilities at Meyer Range are listed in Table D-1, App. D.
2. Dona Ana Range Complex--Field artillery weapons, ADA automatic weapons, and small arms and machine guns are all fired at the Dona Ana Range Complex. The ranges in this complex are located approximately 32 km northwest of the main cantonment area west of U.S. Highway 54 and MA-3 through MA-6. Firing of artillery, mortar, and other large-caliber rounds is directed westward into the Dona Ana Impact Area. Dona Ana firing range descriptions, along with their primary and secondary uses, are listed in Table D-2, App. D.

   Dona Ana Range is used for firing of artillery, armor, and air defense weapons. The range also supports close air support and radar tracking missions, airborne drops, and light and heavy target missile flights. During FY 1982, a total of 72 tube-launched, optically-tracked, wire-command linked (TOW) missiles and 54 Dragon missiles were fired at the Dona Ana ranges, along with 552,217 rounds of machine gun, artillery, and mortar firing (Table D-3, App. D).
3. McGregor Range Complex--McGregor Range Camp and associated firing points are located in New Mexico, approximately 38 km

north of the cantonment area. Missile firing ranges are located to the north and east of McGregor Range Camp, with firing fans directed northeastward into the McGregor Missile Impact Area. The latter is surrounded by a secondary danger zone, providing a buffer zone between the impact area and the installation boundary. The Aerial Gunner Range (Cane Cholla), used primarily by the 3d ACR, is located to the northwest of the northernmost missile firing point. The Pershing Launch Site is located due south of Cane Cholla. McGregor firing points and impact areas are shown on the installation range firefighting map (FTBL DEH, 1974).

North McGregor Range is located on the east side of U.S. Highway 54, approximately 35 km north of McGregor Range Camp. The primary function of North McGregor Range is to serve as a test range for USARADBD and contractor testing and for forward area weapons (FAW) service practice.

Primary and secondary uses of McGregor ranges and weapons authorized are listed in Table D-4, App. D.

McGregor Guided Missile Range is the primary test and training range for firing guided missiles and air defense weapons. Missiles and rockets fired at McGregor and dates of firing are listed in Table D-5, App. D. Additional missiles fired at South McGregor include Vulcan 20-mm guns, Nike Ajax (between 1953 and 1977), and Nike Hercules from (1974 through the present). Additional missiles fired at North McGregor Range include Vulcan 80-mm guns, Roland missiles, Sgt. York 40-mm guns, and 40-mm Dusters.

Based on the McGregor Guided Missile Range Restricted Area Annual Utilization Report for FY 1982 available from Range Command, a total of 448 missiles and 540,091 rounds of 20-mm

and 40-mm ADA rounds were fired at McGregor Range for tactical training and testing of personnel in utilization of individual-served and/or crew-served air defense and artillery weapon systems.

Additional use of McGregor Range airspace was made by missile system training and testing involving high-performance aircraft (including A-7, T-29, T-38, F-111, and B52), MQM 34 and 107, and rotary-wing aircraft. These aircraft are used for electronic countermeasures, aerial combat maneuvers, tactical training for missile crewmen, launch of short-range attack missiles (SHRAMs), and towing of various types of targets.

FTBL used an additional parcel of land, Castner Range, for live-fire operations until 1966. Castner Range contained 3,359 ha of land through 1966, when 485.6 ha were surface cleared along the North-South Freeway right-of-way for the city of El Paso (DDESB, 1976). The remaining 2,873.4 ha of the former artillery range are currently under management of GSA and not used by FTBL units for training or maneuvers.

Between 1928 and 1966, a variety of ordnance was fired into Castner Range, including Stokes mortar shells, 8-inch (in) coastal artillery shells, and various calibers of field and ADA. Ranges and range fans existing in 1953 were located in the southeastern portions of Castner Range and used the eastern slopes of the Franklin Mountains as impact areas. Due to expansion of the city, this range currently adjoins residential developments of El Paso.

No documentation of Castner ranges and impact areas exists prior to 1953. UXO or projectiles found on various portions of the range include:

- .22-caliber (cal), .30-cal, and .45-cal weapons
- 3.5-in rockets

rifle grenades
handgrenades
4.2-in mortars
81-mm mortars
3-in, 105-mm, 90-mm, 75-mm, 40-mm, and 37-mm projectiles

Contamination of Castner Range is apparently limited to UXO, white phosphorus (WP), and possibly smoke rounds. Currently, the 2,873.4 ha of Castner Range under the custodial care of FTBL remain contaminated by UXO.

2.1.7 TOXIC/HAZARDOUS MATERIALS (HANDLING AND STORAGE)

This section describes past and current handling and storage of pesticides, polychlorinated biphenyls (PCBs), chemicals, radiological materials, and chemical/biological (CB) agents.

Pesticides

Pesticides (insecticides, herbicides, fungicides, avicides, and rodenticides) have been and are currently being used to maintain grounds and structures and to prevent pest-related health problems. Pest control services include: (1) household, structural, health-related, and nuisance insect and rodent control programs; (2) weed control at security fences, parking areas, and utility sites; and (3) programs involving turf areas (e.g., golf courses) and ornamental trees and shrubs. Pesticides are stored and used by the DEH Entomology Section, DEH Grounds Maintenance Section, DPCA golf course, and Battalion Field Sanitation Units.

DEH Entomology Section--Prior to 1980, pesticides had been stored in metal buildings west of Bldg. 1160 and in Bldgs. 1166 and 1135. Currently, insecticides, rodenticides, and avicides are stored in Bldgs. 60-276 and 1235. The fire department has been notified of the contents of the two buildings.

Bldg. 60-276 is a Butler building, located north of Bldg. 1122, with an uncurbed metal floor, contrary to EPA-recommended procedures (EPA, 1982h). Warning signs are posted on the outside of the building, in compliance with EPA (1982h) and U.S. Army (1980a) regulations.

Bldg. 1235 is constructed of rock masonry and is ventilated. The floor is uncurbed, contrary to EPA-recommended procedures (EPA, 1982h), and has a floor drain that leads to the sanitary sewer system. Pesticides are segregated and stored on the floor. Signs ported outside the building forbid smoking but do not indicate that toxic/hazardous materials are stored in the building, contrary to EPA (1982h) and U.S. Army (1980a) regulations. [Subsequent to the site visit, it was reported that, in the near future, warning signs will be placed on all buildings in which pesticide chemicals are stored.]

Formulation and mixing of the pesticides occur primarily outside Bldg. 60-276. The mixing area is equipped with a deluge shower, eye lavage, and personal safety equipment. The water supply is equipped with a backflow-prevention device.

Empty pesticides cans are triple-rinsed, and the used pesticides containers are disposed of as ordinary solid wastes, in accordance with Federal regulations (EPA, 1982h). Rinseates from empty container and equipment washing are poured onto the ground rather than retained as a diluent for subsequent mixing operations. Open dumping of pesticide-related wastes is in violation of EPA (1982h) and U.S. Army (1980a) regulations. [Subsequent to the site visit, it was reported that contaminated rinseates will be used as a solution base for preparation of further pesticide solutions.]

Four of the seven pest control personnel are certified, as required by U.S. Army (1980a) regulations, and the other three are scheduled for certification training in the near future. Blood cholinesterase levels

are monitored quarterly, and no problems have been reported with regard to blood tests.

An inventory of pesticides stored in Bldgs. 60-276 and 1235 is presented in Table 2.1-3.

A small amount of pesticides (fly strips and pyrethrin) is stored in the Entomology Section eating area, contrary to EPA-recommended procedures. [Subsequent to the site visit, it was reported that the practice of storing pesticides in areas where food is consumed has been discontinued.]

DEH Grounds Maintenance Section--Since 1974, the Grounds Maintenance Section has been responsible for the application and storage of herbicides on FTBL. The section employs a foreman who is certified and an applicator who is not certified. U.S. Army (1980a) regulations require that all personnel involved in pesticides application be certified. [Subsequent to the site visit, it was reported that emphasis is being given to achieve the goal of certification for all personnel.]

Herbicides are stored in a portion of Bldg. 11160, which is a wooden warehouse with uncurbed flooring. Pesticides are segregated by type and stored on the floor. Warning signs have been posted on the outside of the building. An inventory of pesticides stored in Bldg. 11160 is presented in Table 2.1-3.

Mixing of herbicides occurs at various standpipes, most of which are not equipped with backflow-prevention devices. Pesticide containers are triple-rinsed and discarded to the landfill. Rinseates from empty containers and equipment are poured onto the ground rather than being retained as a diluent for subsequent mixing operations. [Subsequent to the site visit, it was reported that contaminated rinseates will be used as a solution base for preparation of further pesticide solutions.]

Table 2.1-3. Pesticides Stored at FTBL

User	Date of Inventory	Pesticide	Quantity on Hand
DEH Entomology Section	Feb. 8, 1983	Acti-Dione PM	1.4 kg
		Pyrethrium (0.6 %)	49 kg
		Avitrol	1.8 kg
		Baygon (1.5%)	515 l
		Chlordane (72%)	151 l
		Diazinon 4E (47.5%)	1,605 l
		Diazinon (2%)	193 kg
		Dipel Bacteria (0.064%)	10 kg
		Durshan (41.2 %)	11 l
		Kilz-N (85%)	87 l
		Lindane (97%)	19 l
		Lindane (1%)	22 l
		Malathion (57%)	435 l
		Methyl Bromide	27.6 l
		Phostoxin	38 kg
		Pyrethrium ULD (39%)	4.7 l
		Rodenticide Anticoagulant	360 blocks
		Rodenticide Anticoagulant Mix (0.3%)	10 kg
		Anailicide	9 kg
		Sevin Powder Carbaryl (80%)	186 kg
		Thuricide Powder (3.2%)	7 kg
		Thuricide HPC (48%)	57 l
DEH Grounds Maintenance Section	Dec. 7, 1982	Atrizine (Aatrex) (80%)	1,135 kg
		Simazine (80%)	568 kg
		Pramitol (25%)	1,874 l
		DSMA (63%)	454 kg
		Kerb (50%)	10 kg
		Round-Up	795 l
		Sodium TCA (90%)	318 kg

Table 2.[-3. Pesticides Stored at FT8L (Continued, Page 2 of 2)

User	Date of Inventory	Pesticide	Quantity on Hand
		Dacapon	68 kg
		Casoron G4 (4%)	136 kg
		Tordan 2K (2.3%)	91 kg
		Urox B (40.8%)	927 l
DPCA Golf Course	Feb. 17, 1983	Roundup (41%)	38 l
		Thiram (75%)	16 kg
		D-Tox-4E (48.2%)	30 l

Source: ESE, 1983.

DPCA Golf Course--Pesticides used on the golf course are stored in Bldg. 3007, a metal building in poor repair with a rotting wooden floor. Furthermore, Bldg. 3007 does not have toxic/hazardous materials storage warning signs posted outside, contrary to EPA (1982h) and U.S. Army (1980a) regulations. [Subsequent to the site visit, it was reported that, in the near future, warning signs will be placed on all buildings in which pesticide chemicals are stored.] An inventory of pesticides stored in Bldg. 3007 is presented in Table 2.1-3.

Mixing occurs on the golf course. Pesticides are applied by a certified applicator, and rinseates from the sprayer reportedly are diposed of by spraying over the area just treated, in accordance with EPA (1982h) regulations. Water spigots used in mixing are not equipped with backflow-prevention devices.

Battalion Field Sanitation Units--Each battalion field sanitation unit has been issued the following pesticides:

- lindane dusting powder (unspecified quantity),
- baygon (1.0 percent, 4:1),
- pyrethrin or resmethren (unspecified quantity),
- warfarin (2.3 kg), and
- diazinon (0.5 percent, unspecified quantity).

The pyrethrin and diazinon supplies are to be expended without replacement. Storage conditions vary from one unit to another.

PCBs

PCBs are found on FTBL in out-of-service and in-service electrical equipment (e.g., transformers and capacitors). A survey of in-service transformers, utilizing both nameplate information and selected testing, has identified 29 PCB-contaminated [>50, <500 parts per million (ppm) PCB] or PCB-containing (>500 ppm PCB) transformers. Upon removal from service, transformers that have been found to be free of PCBs (<50 ppm) are taken to the DPDO yard for disposal. Transformers known to contain

or to be contaminated with PCBs are taken to Bldg. 11614 for storage. Transformers which have not been tested are taken to Bldg. 11614, where fluid samples are removed for analysis. Depending on the outcome of the analysis, the transformer either remains in Bldg. 11614 or is sent to DPDO. Bldg. 11614, a recently-constructed metal building with impervious, curbed flooring, does not have warning signs posted but otherwise meets all regulations (EPA, 1982g) for storage of PCBs and PCB articles. [Subsequent to the site visit, it was reported that warning signs have been posted on two sides of the building, the main door and the west side wall.] Bldg. 11614 currently contains 20 drums of PCB fluid, seven transformers containing PCBs, and 58 capacitors. Seventeen containers of PCB-contaminated floor sweep are currently being stored in Bldg. 11122. Bldg. 11122 is made of rock masonry and has an uncurbed, impervious floor and warning signs posted outside. Due to the uncurbed flooring, this facility is not appropriate (EPA, 1982g) for storage of PCB-contaminated materials. [Subsequent to the site visit, it was reported that PCB-contaminated floor sweep is properly stored.]

Prior to Federal control of PCBs and PCB articles under the Toxic Substances Control Act (TOSCA), the disposition of unserviceable electrical equipment was through DPDO sale to repair and/or retail salvage contractors. Reportedly, this equipment was transported offpost with fluids intact.

Chemicals

Selected activities on FTBL use toxic and hazardous chemicals in support of specific missions. These activities are: (1) water analysis laboratories, (2) photographic laboratories, (3) medical laboratories, (4) oil analysis laboratory, (5) pest control services, and (6) vehicle maintenance. Use and disposal of chemicals specific to each activity are discussed in the sections on industrial operations (Sec. 2.2.1), laboratory operations (Sec. 2.1.3), and pesticides and radiological materials (Sec. 2.1.7). During the site visit, no incompatible chemicals were observed being stored together.

DPDO is currently using Bldg. 11122 for the storage of various hazardous wastes, including PCB-contaminated floor sweep. Bldg. 11122 has an uncurbed floor and warning signs posted outside. The fire department has been notified of the building's contents. [Subsequent to the site visit, it was reported that PCB-contaminated floor sweep is properly stored.]

For several years prior to 1980, DPDO stored 126 19-l cans of DDT in Bldg. 11127 on wooden floors. In 1980, the DDT was shipped to a hazardous waste disposal site in Emelle, Ala.

Prior to 1967, DPDO was located in the 1100 block area, utilizing Bldgs. 1125 through 1128 and nearby open areas. DDT, other pesticides, and transformers were stored in these areas.

Radiological Materials

Medical Sources--Medical uses of radioisotopes occur in the Nuclear Medicine Service, the Clinical Investigation Service, the Radiation Therapy Service, and the Department of Pathology, all of which are associated with WBAMC. The isotopes used by WBAMC are covered by the following three licenses and authorizations:

1. U.S. Nuclear Regulatory Commission (NRC) Byproduct Material License (BML) 42-05255-07--This license authorizes the use of reactor byproduct materials for diagnosis, therapy, and in vitro testing. The license expired May 31, 1979. An application to renew the license has been made and is pending.
2. NRC BML 42-05255-08--This license authorizes the use of cobalt-60 for teletherapy and expires July 31, 1987.
3. Registration Certificate No. 5988--This registration authorizes the use of byproduct material for in vitro clinical or laboratory tests not involving human beings or animals under the general license provisions of NRC (1982a).

A large variety of isotopes are used in the Nuclear Medicine Clinic in the form of radiopharmaceuticals and sealed calibration standards. The isotopes are stored and administered on the 12th floor of WBAMC. Isotopes on hand as of June 30, 1982, are listed in Table 2.1-4.

All areas are marked with warning signs, and the rooms are monitored weekly for radiation. Workers utilize whole-body and finger radiation monitoring badges. Workers have reportedly not been exposed to radiation levels in excess of maximum allowable limits.

Spills of radioactive materials have been confined to routine losses from syringes and other operational losses. In such instances, the spillage is wiped up and the area is monitored for isotope residues. The wipes are stored and disposed of in accordance with practices appropriate for that isotope.

Disposal of liquid iodine-125 occurs by dilution into the sanitary sewer system. The total quantity of radioactivity discharged to the sanitary sewer is substantially less than the 1-curie-per-year (Ci/yr) limit permitted by NRC regulations (NRC, 1982b). Other short-lived isotopes are stored for a minimum of 10 half-lives in a locked room on the 12th floor of WBAMC and then discarded as cold waste in the landfill. Long-lived isotopes to be discarded are placed in a drum in Bldg. 1336 for shipment to an approved radioactive waste disposal site.

The Department of Clinical Investigation employs tritium and iodine-125 on the 12th floor of WBAMC. Iodine-125 liquid is discharged to the sanitary sewer. Liquid scintillation vial (LSV) waste, consisting of tritium in a xylene base, is stored in Bldg. 1336 for later shipment to an approved nuclear waste disposal facility.

The Radiation Therapy Service utilizes sealed sources of cobalt-60, strontium-90, iridium-192, iodine-125, and cesium-127 for therapeutic purposes. The sources are stored in the Radiation Therapy Clinic in the

Table 2.1-4. Inventory of Medical Radioactive Materials at FT8L

Isotope	Authority*	Quantity on Hand June 30, 1982 (mCi)	Maximum Quantity Authorized (mCi)
Radiopharmaceuticals			
Phosphorus-32	BML 07	0.00033698	100
Chromium-51	BML 07	0.01393	100
Gallium-67	BML 07	5.4648967	100
Indium-111	BML 07	0.0292789	100
Molybdenum-99/Technetium-99	BML 07	0.166	5,000
Iodine-125	BML 07	0.02274	100
Sealed Calibration Standards			
Cesium-137	BML 07	1.09375	1,000
Cobalt-57	BML 07	7.00502	100
Cobalt-60	BML 07	7.86407	100
Gold-195	BML 07	0.39698	100
Sealed-Source Therapy			
Cesium-137	BML 07	1,641	2,000
Strontium-90	BML 07	40	100
Cobalt-60	BML 08	8,095,000	21,400,000

*NRC 07-NRC BML 42-05255-07
NRC 08-NRC BML 42-05255-08

mCi = millicuries.

Source: WBAMC Nuclear Medicine Service, 1982.

first floor of WBAMC. After decaying to unusably low levels, the iridium-192 and cobalt-60 are returned to the manufacturer. The cesium-137 and strontium-90 are long-lived isotopes and have not been discarded. The iodine-125 remains with the patient. Sealed sources on hand as of June 30, 1982, are listed in Table 2.1-4.

The carbon-14 waste generated by the Microbiology Section of the Department of Pathology is sterilized and sent to the landfill as cold waste.

All medical uses of radioisotopes have reportedly been restricted to the buildings currently utilized for such activities.

Calibration Sources--The TMDE Support Team, a DARCOM detachment from MICOM (Redstone Arsenal), provides Radiac calibration capabilities for radiological monitoring devices (e.g., PDR-27s) maintained at FTBL. The unit is responsible for two AN/UDM-2 and one AN/UDM-6 Radiac calibrators stored in Bldg. 2588. The AN/UDM-2 calibrators each contain 200 mCi strontium-yttrium-90 and are licensed under NRC BML 29-01022-08, held by the U.S. Army Communications and Electronics Command (CECOM). The AN/UDM-6 Radiac calibrator contains 1.4 microcuries (uCi) of plutonium-239, licensed under NRC Special Nuclear Material (SNM) License No. 1745, Amendment .01, held by the U.S. Army Armament Materiel Readiness Command (ARRCOM).

All of the above storage locations are secure facilities marked with warning signs. The areas are subjected to periodic wipe tests, and radiation film badges are worn by personnel in the areas. No problems were reported with either the monitoring of the storage areas or exposure of personnel.

Available records (USAEHA, 1964) indicate that a TS-784 Radiac calibrator has been stored between Warehouses 37 and 38 in a small, outside concrete pit with a locked lid. In addition, radioactive

coating compound has been stored in Bldg. 2527. Both the TS-784 Radiac calibrator and the coating compound have reportedly been removed from FTBL.

Additional Sources--Additional radiation sources stored at FTbL include an unspecified number of PDR-27 radioactive test samples containing 5 mCi of krypton-85, low-light-level rifle sights with 1 mCi of promethium-147 or 9 mCi of tritium, compasses and watches containing tritium, and M140 alignment devices containing tritium. These items are stored within the various units at FTBL. The M140 alignment devices are monitored annually by the Radiation Protection Officer (RPO) for leakage. The M140 alignment devices are permitted under NRC BML 72-00722-06, held by ARRCOM. Unserviceable items are not currently being turned in to the RPO for disposal, as required by Army Regulation (AR) 385-11 (U.S. Army, 1980b). [Subsequent to the site visit, it was reported that the installation has notified the U.S. Army Health Services Command, WBAMC's PVNTMED Activity, and an SOP is being developed to correct current procedures.]

On occasion, the NBC School borrows cobalt-60 sources from the state of Texas. When not in use at the NBC School, the sources are stored offpost.

The FTBL RPO performs periodic monitoring of areas used by the Nuclear Weapons Support Detachment in Bldg. 2538. No problems have been encountered in this area with regard to contamination.

CB Agents

No record was found of the manufacture, storage, or use of lethal CB agents or munitions at FTBL.

Riot control agent CS and amyl acetate are used for training purposes. CS is stored at the ammunition supply point (ASP).

Contingency stocks of super topical bleach (STB) and DS-2 are stored with each unit. Expired or unserviceable DS-2 is used at the decontamination site north of the Noncommissioned Officers (NCO) Academy for training purposes.

The 84th Chemical Company uses fog oil on Range 40.

2.1.8 PETROLEUM, OILS, AND LUBRICANTS (POL) HANDLING AND STORAGE

The Spill Prevention Control and Countermeasure (SPCC)/Installation Spill Control Plan (ISCP) (FTBL DEH, 1982b), which is currently in draft form, identified three main storage/handling sites (Table 2.1-5). The SPCC/ISCP does not provide a complete and itemized listing of bulk POL storage sites, as required by EPA (1982f) and U.S. Army (1982) regulations. [Subsequent to the site visit, it was reported that the SPCC/ISCP was updated in April 1983 and has been distributed.] It was reported that numerous smaller tanks and/or areas not listed in the SPCC/ISCP are protected and operated in the same manner as those covered in the plan. Bulk storage includes diesel fuel, No. 5 fuel oil, aviation gasoline (AVGAS), JP-4, and motor vehicle gasoline (MOGAS), with many smaller tanks for waste oil.

Fuel oil (No. 5) is stored in quantity only at Bldg. 7145, which is also the only large aboveground tank. Fuel oil is used to fire the WBAMC boiler plant. The tank has an adequate concrete berm for secondary containment.

It was reported that underground tanks are not routinely leak tested, but are gaged daily to determine if losses are occurring. The SPCC/ISCP does not specify a procedure or responsible organization for gaging, leak testing, or inspecting tanks. [Subsequent to the site visit, it was reported that the Environmental Protection Office, DEH, will develop a program in the near future which will cover all necessary precautions to prevent a spill of any kind (including underground tanks)].

Table 2.1-5. POL Storage Locations/Contents at FTBL

Location	No. of Tanks	Capacity (1)	Contents	Type of Tank
11100 Area BAA				
	2	94,000	Diesel	UG, Steel
	2	94,000	MOGAS	UG, Steel
	4	94,000	JP-4	UG, Steel
	1	94,000	AVGAS	UG, Steel
	4	45,000	Diesel	UG, Steel
	2	5,000	Solvent	UG, Steel
199 AAFES PX				
	6	36,000	MOGAS	UG, Steel
7145 WBAMC				
	1	94,000	No. 5 Fuel Oil	AG, Steel

UG = Underground.
AAFES = Army and Air Force Exchange Service.
PX = Post Exchange.
AG = Aboveground.

Source: FTBL DEH, 1982b.

Field examination indicated that most drum storage areas have containment structures. Some spillage was observed outside the sandbagged area near drum storage sites at several of the tactical equipment shops.

Mobile storage of POL is not routinely practiced at FTBL, although it is employed during some major field exercises. At the airfield, tankers filled at Bldg. 11116 are taken to various points on taxiways and used to fuel aircraft. Military units utilize dispensing areas in the tactical equipment shop compounds to refuel tactical and support vehicles during daily operations. Procedures for use of mobile storage are not discussed in the SPCC Plan.

One reportable spill has occurred at FTBL, the result of a mobile tank rupturing at a remote desert location during a field exercise. Reportedly, the fuel (several thousand liters) rapidly evaporated and/or was absorbed into the sand. Notification was given to proper authorities, and subsequent site examination indicated that no cleanup actions were required.

2.2 DISPOSAL OPERATIONS

2.2.1 INDUSTRIAL WASTES

The major waste-producing industrial operation at FTBL is vehicle and aircraft maintenance. Supply records for recent years indicate that as much as 1,000,000 liters per year (lpy) of POL are used by these operations. These maintenance operations also produce significant quantities of waste solvents, paint, and acid waste. Smaller industrial operations produce lesser quantities of cleaning solvents and paint thinner.

DEH

DEH personnel have been involved in waste oil collection, maintenance of oil/water separators used in maintenance areas, and operation of several small shops. Waste oil disposal, the major industrial waste-handling

activity, involves wastes generated by many other activities. Thus, DEH will be discussed first, and specifics of disposal operations conducted by other directorates will be discussed in subsequent sections.

Approximately 30 to 40 percent of waste oil produced onpost is placed in 55-gallon (gal) drums and transported to the firefighting training area at BAA. It is stored temporarily in an open sand yard and used as fuel in training exercises. Other liquid waste, including solvents and contaminated fuel, are also disposed of in this manner. Until very recently, materials reaching the firefighting training area likely included some chlorinated solvents and perhaps other toxic/hazardous liquids. Ongoing efforts to eliminate routine use of hazardous materials by product substitution should reduce or eliminate this problem. Fire department personnel attempt to sort incoming drums by contents, although shop personnel report that oils and various solvents are often mixed in the same drum. For example, waste acids and hazardous halogenated organic solvents generated by the oil analysis laboratory (see Sec. 2.1.3) are mixed with waste oils used in firefighting training. This not only presents a safety risk to firefighting personnel but also is contrary to RCRA (EPA, 1982b) regulations for disposal of hazardous wastes. [Subsequent to the site visit, it was reported that the FTBL Hazardous Waste Management Plan restricts the contamination of used oil with hazardous waste so that all used oil can be recycled under the Resource Recovery Plan.]

The remaining 60 to 70 percent of waste oil produced is temporarily stored at the generation sites, usually in underground tanks. These tanks are periodically pumped out, and the contents are presumably taken offpost for sale and/or recycling. No official agreement or authorization exists for this practice. At the time of the site visit, personnel from DEH and DPDO were working on establishing a formal contract with a waste POL recycling company. [Subsequent to the site visit, it was reported that a used oil pickup contract (METRO Oil Corp.,

Tucson, Ariz., Contract No. 41-3250-002, effective dates: Apr. 8 to Sept. 30, 1982) has been instituted.]

In the past, and perhaps as recently as the late 1960s, some waste oil was dumped in pits dug in the landfill area for that purpose. These pits were reportedly open for use by any unit onpost, and no restrictions were placed on the type of material dumped.

The routing of wash rack discharges through oil/water separators to the sewage treatment plant (STP) and the recycling of waste oil from vehicle maintenance facilities have largely eliminated oily waste discharges to surface water or land. Prior to institution of existing procedures, wastewater from vehicle wash racks often discharged to the storm drainage system. A current problem with clogging of wash rack drains because of lack of routine cleaning results in washing in unauthorized areas, as well as some continued discharge to storm sewers. When equipment is working and procedures are followed, all wash rack water runs through an oil/water separator and grit trap into the sanitary sewer. [Subsequent to the site visit, it was reported that a service contract was awarded to clean all wash racks and to put them in serviceable order. The fact that maintenance of wash racks is a troop responsibility was emphasized to units concerned.]

DIO

The largest industrial operation under DIO is the MRD facilities in the 2500 block area. These facilities provide DS/GS maintenance to all units. Vehicles are normally first referred to the 513th Maintenance Battalion when required repairs exceed unit capabilities, although some go directly to DIO if it appears that major rebuilding is required. DIO services wheeled and tracked vehicles, missiles, and support equipment. MRD is equipped to perform complete vehicle overhauls, including engine and transmission rebuilding and repair. Numerous small cleaning tanks containing Type II Stoddard or PD-680 drycleaning solvent are used for parts cleaning. Waste oil and solvents are generally drummed and taken

to the firefighting training area, although some recent instances of dumping this material in storm drains were reported.

FTBL is in the process of replacing existing cleaning tanks with self-contained units that will eliminate any draining and refilling by post personnel. These new units are serviced by a contractor who removes spent solvent containers and installs fresh ones.

Spent electrolyte from vehicle batteries is neutralized and dumped into the Bldg. 2515 drain. It was reported that sludge or solids left in the neutralization tank are also rinsed into the drain. Discussions with post personnel and examination of engineering blueprints failed to reveal if this drain is connected to the sanitary or stormwater drainage system. [Subsequent to the site visit, it was reported that these operations discharge their wastewater into the city of El Paso's sanitary sewer. The disposal of battery acid has been discontinued, and undrained batteries are now being given to the Department of Energy for recycling.]

Painting is conducted in Bldg. 2518 in a large wet-curtain paint booth. Small quantities of lead-based paints are used. This booth is drained about every 6 months, and the 1,000 l of liquid are presumably discharged into a drain in the building. Discussions with post personnel and examination of engineering blueprints failed to reveal if this drain is connected to the sanitary or stormwater drainage system. [Subsequent to the site visit, it was reported that this drain discharges into the city of El Paso sanitary sewer system.] Each cleaning produces approximately 200 l of sludge, which are taken to the landfill. Thinners used to clean spray guns and other equipment are containerized and turned over to DPDO.

DIO NRD also operates the commercial vehicle shop in Bldg. 1334. This facility maintains 700 vehicles, including buses, automobiles, vans, and trucks and generates waste oil and solvent. These wastes are stored in

an underground tank, which is pumped out periodically and sold to various recycling contractors.

Maintenance and repair of helicopter and fixed-wing aircraft at BAA produce wastes totaling approximately 200 liters per month (l/month), which are primarily waste oil but include solvents and minor amounts of hydraulic fluid and paint thinner. These wastes are stored in drums in the maintenance area and delivered to the firefighting training area.

DIO MRD also handles nickel-cadmium batteries in the missile shop at Bldg. 2588. Unserviceable batteries are turned over to supply and exchanged for replacements. The returned batteries are reconditioned by an offpost contractor.

513th Maintenance Company

The vehicle maintenance facility in Bldg. 1250 is operated by the 513th Maintenance Company. This facility provides DS maintenance services to the 3d ACR and other units onpost; it also contains facilities for major repair and component rebuilding and services both combat and tactical vehicles.

During a recent visit by USAEHA personnel, the drainage ditch exiting the Bldg. 1250 area was found to contain significant quantities of oil. The ditch drains an area containing a wash rack, which was unusable at the time of the site visit due to clogging as a result of failure to adequately maintain the oil/water separator and grit trap. Unit personnel were washing vehicles and steam cleaning engines in the open dirt area beside the wash rack, which resulted in oily wastewater flowing into the unlined ditch. The visible evidence of spillage had been cleaned up before the site visit, but similar instances of washing in unauthorized areas were observed at several other locations. DEH recently obtained permission to landfill sludge and solids from the wash rack drains, and a cleaning program which would eliminate surface discharges of oily wastewater will be implemented soon.

TASC

Under DIO, TASC operates photographic shops in Bldgs. 11236 and 11115. Wastes produced by these shops consist of silver-containing fixer and developer from the standard film processing operation. Fixer is treated for silver recovery and discharged to the sanitary sewer.

Tactical Equipment Shops

The 19 tactical equipment shop areas are similar in design, function, and operation. They provide facilities for military units to perform operational maintenance of vehicles and are, in many instances, shared by several units. Each contains areas for maintenance, tool storage, offices, and support shops. Much of the maintenance work is performed in the yard, where approximately 100 to 200 tracked and wheeled vehicles may be stored at any given time. When the vehicles are parked for extended periods, oil drip pans are placed beneath each vehicle. Oil from the drip pans and from vehicles drained during repairs is poured in drains connecting to a holding tank or put in 55-gal drums. Minor spills are generally allowed to soak into the ground, and instances were reported of small amounts of oil or solvent being dumped on the ground when no drum or drain was nearby.

Raytheon

Raytheon conducts equipment maintenance operations in Bldg. 11005. Approximately 200 l/month of waste solutions containing chromium salts are generated by these activities. These solutions are disposed of by pouring them into an aboveground, concrete tank located approximately 500 m northwest of Bldg. 11005. At the time of the site visit, USAEHA personnel were evaluating this operation, including sampling and analysis of soil and sludge samples.

2.2.2 WASTEWATER TREATMENT

Wastewater generated in the FTBL cantonment area is piped into the city of El Paso sewer system and is treated by the city under a utility service contract. The Army is billed monthly for this service based on

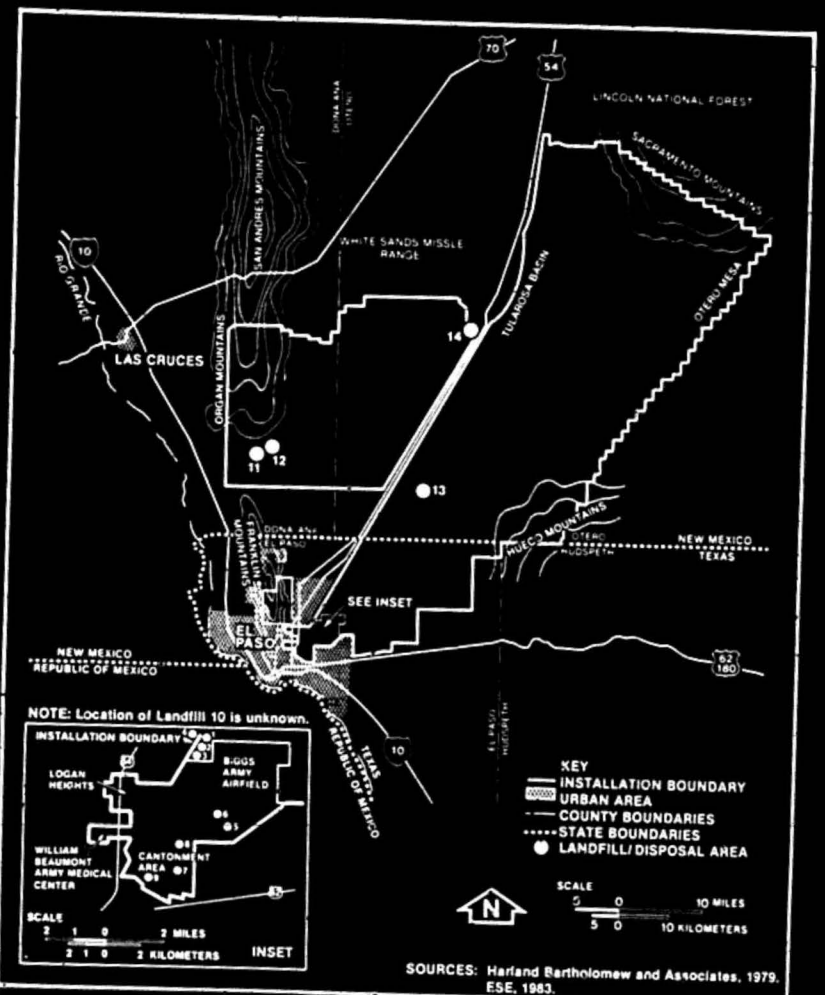
the amount of wastewater, which has averaged approximately 12 million liters per day (MLD) in recent months. The contract does not set limits on flow or specify materials which may or may not be discharged. However, sanitary sewage is defined to include "ordinary amounts of industrial wastes." It was reported that instances have occurred where FTBL was suspected as the source of liquid waste which was incompatible with the city's treatment process.

Range camps and outlying areas of FTBL generally use oxidation ponds for sewage treatment. These are complete retention ponds, and no problems with their use or operation were reported. Several isolated buildings in and around BAA are served by septic tanks. No problems were reported with these tanks, and they do not receive industrial waste.

2.2.3 LANDFILLS/SOLID WASTE

There is currently one permitted sanitary landfill (Location 1 in Fig. 2.2-1) on FTBL (Permit No. 1422, Texas Department of Health). This landfill encompasses approximately 42.8 ha and is being operated as a trench and fill area. Each morning, hospital wastes from the preceding day, as well as any asbestos which may be available, are buried. The waste is compacted with a bulldozer and covered daily. Materials from kitchen grease traps are disposed of in a separate pit at the landfill. Infrequently, one or two 55-gal drums of motor oil reportedly will be disposed of in the landfill. Due to the arid conditions, blowing litter is a problem, even though the landfill is completely fenced.

Past sanitary landfills (Locations 2 through 4) begin at the BAA boundary (see Fig. 2.2-1) and continue north on either side of the Southern Pacific Railroad tracks (FTBL DEH, 1982a; COE, Fort Worth District, 1982), abutting the current landfill and BAA landfill (Locations 5 and 6, respectively). Landfill 4 was located offpost to the west of the railroad tracks. Real estate records for the period of operation (1954 to 1957) are no longer available, but it is likely the landfill operated under an ingrant. Reportedly, these landfills



SOURCES: Harland Bartholomew and Associates, 1979. ESE, 1983.

Figure 2.2-1
LOCATIONS OF LANDFILL/ DISPOSAL AREAS ON FORT BLISS

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

received the same types of materials that go into the current landfill. Each landfill area contained a pit for kitchen grease. From 1947 to 1966, the area of BAA was under USAF control. It is likely, therefore, that Landfills 2 and 4 received waste from FTBL and USAF operations. Unauthorized dumping occurs at the closed landfills, although the installation has posted "no dumping" signs. At several locations, severe wind erosion has exposed buried materials at the surface of the landfills.

Several pre-World War II landfills and dumps (Locations 7 through 11) exist onpost. These areas contain horseshoes, timber, bottles, and papers and appear to have been covered periodically. The Dona Ana and McGregor Ranges and Orogrande Camp each have rubble pits (Locations 12 through 14), which are covered once a month. The rubble pit at Dona Ana receives small arms munitions about once every 3 months [approximately 6.8 to 9.1 kg per year (kg/yr)]. Sanitary trash is hauled to the permitted sanitary landfill from these outlying areas. Some unauthorized dumping occurs along the installation boundaries near high population centers. Available landfill/disposal area data are summarized in Table 2.2-1.

2.2.4 DEMOLITION AND BURNING GROUND AREAS

The demolition and destruction of explosive wastes, unserviceable ammunition, and UXO at FTBL are conducted by the 41st Explosive Ordnance Detachment (EOD), a unit of the 546th Explosive Ordnance Detachment Command Center (EODCC), Fort Sam Houston, Tex. In addition to FTBL areas, the 41st EOD provides explosives demolition support to civilian areas throughout the state of New Mexico and 39 counties in Texas. Areas of primary interest to the 41st EOD are listed in a DA Letter of Instruction (LOI) dated July 28, 1982 (546th EODCC, 1982); detailed information concerning its functions and activities is provided in its mission statement (546th EODCC, 1980).

Table 2.2-1. Landfill/Disposal Areas on FTBL

Landfill/ Disposal Area (see Fig. 2.2-1)	Date Opened	Date Closed	Area (ha)	Type	Materials	Remarks
1	1975	Ongoing	42.8±	Trench	Sanitary	North of BAA, off Southern Pacific Railroad
2	1957	1974	40.4±	Trench	Sanitary	West of BAA
3	1978	1982	40.4±	Trench	Rubble	West of BAA
4	1954	1957	40.4±	Trench	Sanitary	Offpost, west of Southern Pacific Railroad; primarily sanitary waste; no debris evident from wind erosion
5	1947	1967	—	—	Sanitary	Near Bakers Well
6	1947	1967	0.40	—	—	Central portion of BAA
7	WWII	—	2.02	—	Sanitary	South of Forrest Rd., east of Chaffee Rd.
8	Pre-WWII	—	6.06	—	—	North of Haan Rd., east of Chaffee Rd.
9	1942	—	4.04	—	—	Horseshoes, bottles, metals
10	Post-WWII	—	—	—	Hospital Waste	Unlocated
11	Pre-WWII	—	2.02	Trench	Sanitary	South of Dona Ana Complex
12	1983	Ongoing	0.81	Trench	Rubble	South of Dona Ana Complex
13	1983	Ongoing	0.81	Trench	Rubble	Southeast of McGregor Range
14	1983	Ongoing	0.81	Trench	Rubble	South of Orogrande Range Complex

— = Unknown.
WWII = World War II.

Source: ESE, 1983.

The 41st EOD transferred to FTBL from Fort Carson, Colo., on Aug. 10, 1965. No assigned Army EOD detachment was stationed at FTBL previously, although the USAF 35th Munitions Maintenance Squadron provided EOD service at Biggs AFB for USAF demolition support.

The 41st EOD operates an EOD range due east of McGregor Range Camp. This EOD range contains two demolition sites used for EOD and demolition training. The maximum explosive material limit at Demolition Site 1 is 453.6 kg (TNT equivalent); unlimited amounts are authorized at Demolition Site 2. Descriptions and applicable restrictions of the demolition sites are provided in the FTBL SOP for Weapons Firing and Maneuver Area Use (FTBL Range Command, 1981b).

In addition to the 41st EOD, demolitions and demolition training at FTBL are also conducted by the 52d Engineers and 43d Engineers companies, as well as by all ADA units having emergency destruction procedures for weapons. Dona Ana Range 41 is the primary demolition range for engineer construction, demolition, and training. Authorized demolitions involve all types of weapons up to 145 kg (TNT equivalent), including Claymore mines and Shape charges.

The 41st EOD conducts explosives demolitions at the EOD range approximately 2 to 3 times per quarter. Explosive items are blown with C-4 in existing demolition pits, which are visually inspected following each blow. The demolition area is operated under RCRA interim status as a hazardous waste thermal treatment facility. Contrary to EPA (1982b) regulations, no sampling and analysis of residues generated by these activities have been performed. [Subsequent to the site visit, it was reported that, in the near future, USAEHA will perform tests.] Quantities of explosives destroyed average approximately 900 kg per quarter, while demonstrations consist of 2.3- to 4.5-kg charges. Between demolitions, items to be destroyed are separated into explosives, unserviceable ammunition, and initiators and are separately

stored at the ASP. A representative annual EOD Activity and Status Report for the 41st EOD during FY 1982 is shown in Table 2.2-2.

Since 1982, the 41st EOD has not accepted for destruction any ammunition smaller than .50-cal; only ammunition of 20-mm or larger is destroyed at the EOD range. HE artillery and mortar rounds, rocket motors, grenades, and bombs are generally blown in place where located.

Range clearances conducted by the 41st EOD at FTBL include 3-year clearances of Dona Ana Ranges 40, 41, and 42, most recently in September 1981. A total of 686 rounds was destroyed in place, and more than 4,500 rounds were destroyed in collection points. The majority of rounds were 40-mm dusters and 40-mm HE mechanical time fuzes. Ordnance items found included M-23 WP igniters; light antitank weapons (LAWs); 8-in and 4.2-in mortars; 105-mm, 152-mm, 165-mm, and 155-mm artillery; 75-mm and 40-mm grenades; 20-mm, 3.5-in, and 2.75-in rockets; 100-lb photoflash bombs; propellant charges; and 90-mm rounds. A total of 533.5 kg of TNT and 102.2 kg C-4 was used during destruction. The 41st EOD compiled an after action report on this range clearance (41st EOD, 1981).

Additional range clearance is conducted in portions of the Dona Ana and McGregor Impact Areas, as required for maneuvers and JTXs, and in select portions of maneuver areas.

Powder burning is conducted by the 41st EOD at the EOD range. Artillery units are instructed to turn excess powder charges into the ASP for subsequent disposal. Some unauthorized burning of mortar and artillery propellant charges occurs at Dona Ana firing points.

2.2.5 DEMILITARIZATION

Currently, no demilitarization activities are conducted at FTBL, other than the destruction of unserviceable ammunition and UXO by the 41st EOD. Records show that following World War I, the Supply Division of

Table 2.2-2. 41st EOD Activity and Status Report for FY 1982

Line No.	Source	Manhours	Small Arms	Artillery/ Mortar	Grenades	Rockets/ Jatos	Pyrotechnics	Propellant* (lb)	Bulk Explosives† (lb)	Hazardous Explosive Materials**
1	ACR	50	—	3,590	67	182	747	1,010	366	504
2	Incidents	—	799	880	660	310	96	—	564	170

— = Not reported.

* Propellant: rocket motors, propellant charges (artillery, mortar), cordite propellant.
† Bulk explosives: TNT, C-4, blasting caps, detonating cord.
** Hazardous explosive materials: unserviceable ammunition (Code H), small arms through artillery shells, all encased munitions and Shape charges.

Source: 41st EOD, 1982.

Field Service sent 75-mm guns, 155-mm howitzers, tanks, .30-cal rifles, machineguns, and automatic pistols, among others, to FTBL for overhauling, cleaning, reconditioning, and storage (Green et al., 1955).

2.2.6 RCRA STATUS

FTBL filed a Notification of Hazardous Waste Activity with EPA in November 1980 and was assigned EPA I.D. No. TX 4213720101. This filing indicated storage of DDT and disposal of explosives by detonation (thermal treatment). As discussed in Sec. 2.1.7, the DDT has been properly disposed of by a hazardous waste contractor. At some future date, certainly before filing of a Part B RCRA application becomes necessary, this information should be updated to reflect current knowledge.

2 3 WATER QUALITY

2.3.1 SURFACE

Surface water features on FTBL consist of seasonal playas, ephemeral streams, and oxidation ponds. In addition, small ponds have been developed in the northeastern portion of FTBL from water in the adjoining Lincoln National Forest to support cattle grazing and wildlife management programs (FTBL, 1979). Surface water quality data are not available.

2.3.2 SUBSURFACE

FTBL is underlain by the Hueco Bolson aquifer, from which the installation derives most of its potable water. Relatively fresh water [<250 milligrams per liter (mg/l) chloride] occurs beneath the recharge area along the foot of the Franklin and Organ Mountains. Deeper and farther east, the water becomes more highly mineralized.

Below the ground surface at FTBL, a nearly continuous layer of caliche retards the infiltration of precipitation and creates a barrier to the downward migration of potential contaminants. The caliche varies in thickness from less than 1 cm to almost 3 m (FTBL DEH, 1981). Beds of

caliche are also found intercalated with other materials in the bolson deposits to a depth of about 100 m. Local recharge may occur where the caliche is absent or fractured or where earthmoving activities (e.g., landfill operations) have disturbed the caliche layer.

Raw water for the FTBL distribution systems is supplied by wells drilled approximately 80 m into the Hueco Bolson aquifer. The locations and physical characteristics of the wells are described in Sec. 1.6.4. Ground water quality data are available for these wells from the U.S. Army Drinking Water Surveillance Program (USADWSP) for 1972 to 1977 (App. F). The water is hard to very hard and generally meets National Interim Primary Drinking Water Regulations (NIPDWR) and National Secondary Drinking Water Regulations (NSDWR) maximum contaminant levels (EPA, 1982d; EPA, 1982e; Table E-1, App. E). The maximum observed concentrations of lead in Wells 5 and 16 were slightly above NIPDWR criterion, although mean levels were below standards. The source of this contaminant has not been established. Concentrations of total dissolved solids (TDS) in Well 9, Well 12, Hueco Firing Point Well 3, and Site Monitor Well 2 and of chloride in Hueco Firing Point Well 3 exceed NSDWR standards. These high concentrations of dissolved salts are typical of ground water obtained from the Hueco Bolson aquifer. Water with these levels of TDS might have a cathartic effect on people unaccustomed to the water but should have no adverse effect on people acclimated to the water. The chloride level in the Hueco water should pose no health problems to individuals consuming the water but may impart a salty taste to the water. The Hueco water is usually used only for roadwork and firefighting (USAEHA, 1976b).

2.3.3 POTABLE

Water is supplied to FTBL by several separate distribution systems, which include the FTBL main/WBAMC, BAA, city of El Paso, Site Monitor, Dona Ana Range Camp, Hueco Range Camp, and Orogrande Range Camp systems. The FTBL main/WBAMC and BAA distribution systems are connected to the

city of El Paso distribution to ensure additional water supply in case of an emergency.

Water treatment consists of chlorine disinfection preceded, in most cases, by sand filtration. In addition, the cantonment area/WBAMC water is treated with sodium hexametaphosphate for corrosion control, and water provided to WBAMC is softened with a zeolite ion exchange system.

All water distribution systems are sampled for coliform bacteria and residual chlorine in accordance with Technical Bulletin (TB) MED 576. Since the PVNTMED laboratory is not certified by the state of Texas for coliform analyses, a state laboratory performs the bacteriological analyses required to be monitored by the state. The PVNTMED laboratory performs the remaining coliform analyses required by TB MED 576 but not by the state and, in addition, all of the residual chlorine analyses.

Water quality data for the treated water were reported by USADWSP (USAEHA, 1978) and by USAEHA's Extended Trihalomethane (THM) Surveillance of Army Drinking Waters Program. Minimum, mean, and maximum concentrations of chemical and radioactive constituents in the FTBL, BAA, Dona Ana Range Camp, Orogrande Range Camp, and city of El Paso treated water for 1972 to 1977 are presented in App. E. Concentrations of all measured parameters are generally below NIPDWR and NDSWR standards. During 1972 to 1977, the maximum concentrations of lead and mercury observed in the FTBL main distribution system were slightly above the NIPDWR standards, although mean values were well below criteria (App. E). The source of lead, mercury, and iron in the FTBL distribution system was not established, although subsequent sampling of the distribution system for NIPDWR and Texas Department of Health requirements showed no violations of criteria. TDS concentrations in the FTBL main, Dona Ana, and city of El Paso distribution systems and iron in the FTBL main distribution system exceeded NSDWR standards. The high TDS concentrations are a direct consequence of the mineralized

nature of the raw water. Average THM concentrations have been below the 0.10-mg/l maximum allowable concentration (USAEHA, 1982b).

2.4 AIR QUALITY

2.4.1 AMBIENT

FTBL is located in the El Paso-Las Cruces-Alamogordo Interstate Air Quality Control Region (AQCR). Under the Texas Air Pollution Control Regulations (State of Texas, Air Control Board, 1982b), the National Primary and Secondary Air Quality Standards (EPA, 1983) are enforced as the state standards. The national ambient air quality standards are summarized in Table F-1, App. F. The El Paso-Las Cruces-Alamogordo Interstate AQCR is currently a nonattainment area for ozone, particulate matter, carbon monoxide, and lead (State of Texas, Air Control Board, 1982a).

Emission sources at FTBL are minor and are not considered significant contributors to the generally poor air quality in the El Paso area (FTBL, 1979). In 1982, an ambient air quality monitoring program was initiated on FTBL in cooperation with the University of Texas at El Paso. The only data reported to date have been for carbon monoxide and total suspended particulates, both of which were well below air quality standards (University of El Paso, Civil Engineering Department, 1982).

2.4.2 SOURCE EMISSIONS

A recent air pollutant emissions inventory (USAEHA, 1982a) identified five stationary fuel combustion sources (Table F-2, App. F). All of the boilers on FTBL utilize natural gas with fuel oil (No. 2 or No. 5) as backup. The infectious waste incinerator has periodically experienced operational problems. Recommendations have been made by USAEHA to prevent recurrence of these difficulties.

Additional minor sources of air pollutants include painting (particulates and solvent vapor), carpentry (particulates), fuel storage

(volatile organic compounds), and mobile sources. An estimate of air pollutant emissions generated on FTBL is presented in Table F-3, App. F.

2.4.3 PERMITS

Although operational permits are not required and have not been issued for air pollutant sources at FTBL, the incinerators are subject to operational restrictions, in accordance with the FTBL Air Pollution Emergency Episode Plan available from DEH.

2.4.4 NOISE

In 1976, USAEHA conducted a study of the environmental noise impact of FTBL operations (USAEHA, 1976a). Areas investigated included ambient desert noise, ambient urban noise, BAA, medical ambulance service, heavy weapons impact, and the ceremonial cannon. The study concluded that environmental noise from FTBL operations has negligible impact on the health and welfare of people living in El Paso and the desert areas surrounding FTBL ranges. Noise levels on FTBL were found to be lower than on surrounding urban areas as a result of the large land area of FTBL, the nature of FTBL operations, and the routing of noisy operations (tank maneuvers, helicopter flights, and artillery firing) away from populated areas. One complaint has been received by FTBL concerning firing the ceremonial cannon. Investigations by USAEHA indicated that noise levels at the complainant's residence were within EPA blast noise guidelines (USAEHA, 1976a).

2.5 IMPACTS OF PAST AND CURRENT ACTIVITIES ON BIOTA

Five distinct vegetation zones occur on FTBL, ranging from drought-resistant mesquite and creosote bush associations in the Tularosa Basin to mesa grasslands and pinyon-juniper woodlands at higher elevations. The onpost distribution of these vegetation zones and associated plant and animal species is dependent on the considerable variances in available precipitation at different altitudes. Due to generally arid conditions, community structures are relatively simple and species diversities low.

FTBL supports several mammal and bird species of commercial or recreational importance (see Sec. 1.6.5). No Federally listed endangered plant species have been located on FTBL.

Impacts and potential impacts on these species and communities on FTBL are addressed in the installation DEIS (FTBL, 1979) and may be caused by the following installation activities:

1. FTXs, including tactical training employing troops, equipment, and vehicles;
2. Missile, rocket, artillery, and mortar firing;
3. Aerial gunnery training;
4. Air support operations and low-level helicopter flying; and
5. Testing of military weapons.

High noise levels and the potential for wildlife displacement occurs at firing and test ranges, particularly at the Dona Ana Range Complex and impact areas. The highest noise levels are caused by ADA and field artillery weapons firing. USAEHA conducted field studies analyzing noise emissions from 155-mm artillery firings at Dona Ana Range (USAEHA, 1976z). No evidence of long-term or permanent displacement of wildlife populations due to high noise levels has been observed. Aircraft noise, primarily from low-level helicopter flyovers, can cause disturbance and flight in larger mammals, particularly pronghorn antelope (Antelocarpa americana).

Range fires caused by artillery and missile firing destroy vegetation, small mammals, reptiles, and portions of their habitats. Between 1973 and 1976, 135 range fires were recorded on the installation (FTBL, 1979). Although wildfires have a temporarily destructive effect, they maintain certain vegetation communities through exclusion of fire-sensitive species. The effects of FTBL grassfires are discussed in the USAEHA Ecological Analysis of McGregor Range (USAEHA, 1975). A firefighting program is in operation at FTBL.

The use of tracked vehicles and field artillery can cause soil compression, vegetation destruction, and subsequent soil erosion and loss of soil moisture. In addition to habitat destruction, a reduction of species diversity and productivity may be expected in such compacted and destroyed areas. A thorough discussion of impacts resulting from tactical maneuvers on FTBL ranges and maneuver areas is provided in the installation DEIS (FTBL, 1979).

At present, no impacts on resident wildlife species have been observed on FTBL due to installation activities. The extent of adverse impacts such as vegetation and soil destruction, dust generation, wildfires, and high noise levels has not been quantified to date, and the effects on FTBL wildlife resources are unknown. A comprehensive ongoing Ecological Management Program based on an ecosystem approach is planned (FTBL, 1979) to quantify and monitor impacts caused on the biological resources and to determine appropriate mitigative measures. Protective measures currently employed include keeping Otero Mesa grasslands off-limits to military vehicular traffic, maintaining fire control resources, enforcement of SOPs prohibiting utilization of live vegetation for camouflage, and assigning maneuver and firing exercises to specific areas of the post. No vegetation or wildlife losses have been reported on FTBL due to environmental contamination or past and current disposal of toxic and hazardous wastes.

3.0 INSTALLATION ASSESSMENT

3.1 FINDINGS

3.1.1 METEOROLOGY

Climatic conditions of FTBL are characterized by moderate winters and hot, dry summers. The mean daily maximum temperature is 24.4°C; the mean daily low temperature is 10.6°C.

3.1.2 GEOLOGY

FTBL is located in the Basin and Range physiographic province and is underlain by unconsolidated sediments from 0 to 2,743 m below land surface. The majority of the installation is underlain by impermeable caliche and bedrock.

3.1.3 HYDROLOGY

FTBL overlies the Hueco Bolson aquifer system, which is under water table conditions, though some confining beds of caliche occur through the area. Local sources of recharge are along mountain faces and areas where the caliche is fractured. The Hueco Bolson aquifer system provides up to 7,572 lpa of potable water to municipalities, homes, and FTBL.

3.1.4 BIOTA

FTBL is part of the Chihuahua Desert biotic zone but contains five distinct vegetation zones due to altitudinal differences in precipitation. Vegetation communities range from xeric mesquite and creosote bush associations in the Tularosa Basin to mesa grasslands and pinyon-juniper zones on higher portions of the installation.

The distribution and species diversity of wildlife on FTBL are related to the distribution and composition of onpost wildlife habitats. Wildlife diversity and population levels are lowest in the xeric sand

dune-mesquite zone, highest in the alluvial fan and mountain woodland habitats. The FTBL wildlife fauna is primarily composed of species characteristic of desert and western woodlands and includes several species of commercial and recreational importance.

3.1.5 LEASES AND AGREEMENTS

FTBL currently covers 450,306 ha in Texas and New Mexico. Of this total, 94,083.8 ha are owned by the Army, while the remaining 356,223 ha are public domain or used under agreements with the state of Texas and the USDA. In addition to outgrants for building space and transportation and utilities rights-of-way, the New Mexico National Guard holds a license for training on Dona Ana Range, the USAF uses portions of BAA for operation of a weather station and for operational maintenance of aircraft, and Ford Aerospace holds a lease for future testing on North McGregor Range. Grazing of BLM livestock occurs on McGregor Range under a memorandum of understanding.

Excesses of significance include the transfer of land from northern FTBL to WSMR in 1952 and a portion of Castner Range to the city of El Paso in 1966.

3.1.6 LEGAL CLAIMS

Two claims relating to toxic/hazardous materials have been made against FTBL in the past. The first, made in 1974, involved damages paid to the owner of a resort area which was damaged by impact of a malfunctioning missile. The second occurred in 1974-1975 and involved the death of an illegal alien employed by an onpost contractor during range clearing operations.

3.1.7 INDUSTRIAL OPERATIONS

Industrial operations consist mainly of tactical and commercial vehicle maintenance and repair. Smaller operations include small arms repair, painting, aircraft maintenance, missile repair, and photographic processing.

The major waste-producing industrial operations at FTBL are vehicle and aircraft maintenance. These maintenance operations produce waste POL, solvents, and paints. Currently, approximately 30 to 40 percent of the waste motor oil produced on FTBL is drummed in the various maintenance areas and transported to the firefighting training area for use in training exercises. Other petroleum-based wastes (e.g., nonhazardous decreasing solvents and contaminated fuel) are disposed of by mixing with the waste motor oil. Although the installation has eliminated the use of most hazardous materials by product substitution, the current method of handling waste motor oils does not ensure that hazardous wastes are not mixed with the waste oil. For example, waste acids and hazardous organic solvents generated by the fuel analysis laboratory are mixed with waste oil and drummed for disposal in firefighting training exercises. This not only presents a safety risk to firefighting personnel, but also is contrary to RCRA (EPA, 1982b) regulations for disposal of hazardous wastes. [Subsequent to the site visit, it was reported that the FTBL Hazardous Waste Management Plan restricts the contamination of used oil with hazardous waste so that all used oil can be recycled under the Resource Recovery Plan.]

The remaining 60 to 70 percent of waste oil produced is temporarily stored at the generation sites, usually in underground tanks. These tanks are periodically pumped out, and the contents are presumably taken offpost for sale and/or recycling. No official agreement or authorization exists for this practice. At the time of the site visit, personnel from DEH and DPDO were working on establishing a formal contract with a waste POL recycling company. [Subsequent to the site visit, it was reported that a used oil pickup contract (METRO Oil Corp., Tucson, Ariz., Contract No. 41-3250-002, effective dates: Apr. 8 to Sept. 30, 1983) has been instituted.]

Raytheon disposes of waste solutions containing chromium in an aboveground, concrete tank near Bldg. #1005. The concentration of chromium in the waste solutions is unknown. If the level is above

5 mg/l, these solutions would be classified as toxic (EPA, 1982c), and this disposal method would be in violation of RCRA regulations regarding disposal of toxic wastes (EPA, 1982b). While not presenting a potential for offpost migration, leakage from this tank could result in localized soil contamination. At the time of the site visit, personnel from USAEHA were evaluating this disposal process, including soil and sludge sampling and analysis.

3.1.8 LABORATORY OPERATIONS

Two types of laboratories function on FTBL:

1. Photographic laboratories (including medical X-ray laboratories): silver is recovered by WBAMC from hospital and veterinary X-ray photographic solutions and by TASC from photographic solutions. Following silver recovery, spent photographic solutions are discharged into the sanitary sewer system. The MSA (hobby shop) generates small quantities of waste photographic solution and discharges the solutions into the sanitary sewer without silver recovery. These spent solutions should be included in the silver recovery program with the other photographic solutions, in accordance with DOD policy and procedures (DOD, n.d.).
2. Chemical laboratories: Diluted chemical reagents and glassware rinseates from the PVNTMED water analysis laboratory are disposed of into the sanitary sewer, which provides ample dilution. The oil analysis laboratory disposes of waste oils, halogenated organic solvents, acids, and other reagents into a drum which is transported to the fire department for burning in training exercises. Since several of these waste reagents are classified as hazardous wastes, this disposal practice is in violation of RCRA (EPA, 1982b) regulations for hazardous waste disposal. Furthermore, this practice presents a safety risk to firefighting personnel who are unaware of the hazardous constituents mixed with the waste oil.

3.1.9 MATERIEL PROOF AND SURVEILLANCE TESTING

The primary agency conducting materiel proof and surveillance testing at FTBL is USARADBD, which performs DTs and OTs for air defense materiel. OT plans are devised by USAOTEA, and some DTs are tasked by TECOM; major functions and missions of USARADBD are established by TRADOC.

Most USARADBD test programs are conducted at North McGregor Range; the remaining tests are conducted at Dona Ana Range 46. Test programs are summarized in Monthly Significant Action Reports and involve HE and inert artillery rounds and fuel. USARADBD prepares EAs for larger test programs, Categorical Exclusions for tests not requiring an EA.

Additional test agencies at FTBL include the USAADS Test and Evaluation Division, Forward Air Defense Test Directory, and DPT Test and Evaluation Division.

3.1.10 TRAINING AREAS AND ACTIVITIES

The primary field training mission of FTBL is the training of troops in air defense and artillery tactics and systems, including guided missiles and antiaircraft artillery. In response, FTBL is subdivided into McGregor Guided Missile Range; Dona Ana, Hueco, and Orogrande manuever and artillery ranges; and Maneuver Areas I, II, and VIII for tactical maneuver exercises.

Training activities at FTBL include FTXs employing tactical training, missile and artillery firing, aerial gunnery training, air support operations, and related exercises. Field training at FTBL is conducted within eight maneuver areas and numerous firing ranges.

3.1.11 RANGES

FTBL contains a variety of small arms, artillery, mortar, grenade, surface-to-air, and air-to-ground firing ranges. Troop maneuvering and range firing at the McGregor Guided Missile Range; Dona Ana, Orogrande, and Hueco Range Complex; Meyer Small Arms Ranges; and other maneuver

areas are under the control of Range Command. The FTBL DPT Range Branch is responsible for scheduling air space and USAF activities over the reservation.

3.1.12 TOXIC/HAZARDOUS MATERIALS (HANDLING AND STORAGE)

Toxic/hazardous materials (other than ordnance and POL) which are stored and handled include pesticides, PCBs, chemicals, and radiological materials.

The DEH Entomology Section stores pesticides at two locations on FTBL, Bldgs. 60-276 and 1235. Bldg. 60-276 is a sheet-metal building with uncurbed flooring, contrary to EPA (1982h)-recommended procedures. Bldg. 1235 has a concrete foundation, but the floor is not curbed at the doorway and contains a drain leading to the sanitary sewer system. In addition, this building is not marked with appropriate warning signs, contrary to EPA (1982h)-recommended procedures. [Subsequent to the site visit, it was reported that, in the near future, warning signs will be placed on all buildings in which pesticide chemicals are stored.] Three of the seven Entomology Section pest controllers are not certified. U.S. Army (1980a) regulations require that only DOD trained and certified personnel will apply pesticides, or it will be done by others under their direct supervision. Reportedly, non-certified personnel only apply pesticides while in the presence of certified applicators. [Subsequent to the site visit, it was reported that emphasis is being given to achieve the goal of certification for all personnel.] The storage of small amounts of pesticides in the Entomology Section break area where food is consumed is in violation of EPA (1982h) procedures. [Subsequent to the site visit, it was reported that the practice of storing pesticides in areas where food is consumed has been discontinued.] Formulation and mixing of Entomology Section pesticides occur outside Bldg. 60-276 in an area equipped with a deluge shower, eye lavage, personal safety equipment, and backflow-prevention devices on the water supply. Empty pesticide cans are triple-rinsed and disposed of as solid waste, in accordance with Federal regulations. Rinseates,

however, are poured directly on the ground, contrary to EPA (1982h)-recommended procedures and U.S. Army (1980a) regulations. [Subsequent ot the site visit, it was reported that contaminated rinseates will be used as a solution base for preparation of further pesticide solutions.]

The DEH Grounds Maintenance Section is responsible for herbicides on FTBL. Herbicides are stored in Bldg. 11160, which is properly posted with warning signs but which has an uncurbed floor, contrary to EPA (1982h)-recommended procedures. The Grounds Maintenance Section herbicide applicator is not certified and does not have direct supervision by certified personnel while applying herbicides, in violation of U.S. Army (1980a) regulations. [Subsequent to the site visit, it was reported that emphasis is being given to achieve the goal of certification for all personnel.] Herbicides are mixed at various points of potable water supply, which are not equipped with backflow-prevention devices. In addition, rinseates are disposed of on the ground at various mixing points. These mixing and disposal practices are contrary to EPA (1982h)-recommended procedures and U.S. Army (1980a) regulations. [Subsequent to the site visit, it was reported that contaminated rinseates will be used as a solution base for preparation of further pesticide solutions.]

Pesticides used at the DPCA golf course are stored in Bldg. 3007, which is not properly posted with warning signs and has uncurbed, rotting wooden flooring, contrary to EPA (1982h)-recommended procedures. [Subsequent to the site visit, it was reported that, in the near future, warning signs will be placed on all buildings in which pesticide chemicals are stored.] A water supply point used in mixing operations is not equipped with a backflow-prevention device.

Each battalion is assigned a field sanitation unit with a standing inventory of pesticides. The pesticides are stored within the units.

PCBs are found in in-service and out-of-service capacitors and transformers, drums of PCB fluid, and contaminated floor sweep. The installation has conducted a survey of in-service transformers to identify PCB-containing transformers. Out-of-service transformers and capacitors and drums of PCB fluid are stored in Bldg. 11614, which has a curbed, impervious floor and conforms to all EPA (1982g) regulations for storage of PCBs and PCB articles. Warning signs, however, have not been posted on the outside of the building, contrary to EPA (1982g) regulations. [Subsequent to the site visit, it was reported that warning signs have been posted on two sides of the building, the main door and the west side wall.] PCB-contaminated floor sweep is stored in Bldg. 11122. Bldg. 11122 is made of rock masonry and has warning signs posted. This facility, however, has an uncurbed, impervious floor, contrary to EPA (1982g) regulations for PCB storage. [Subsequent to the site visit, it was reported that PCB-contaminated floor sweep is properly stored.]

The TMDE Support Team stores sealed-source radioisotopes contained in Radiac calibrators in Bldg. 2588. No problems were identified with the use or storage of these sources.

The various military units use M-16 rifle low-light-level sights, lensatic compasses, watches, M140 alignment devices, and PDR-27 radioactive test samples containing low-level sources. Unserviceable sources are not being turned in to the RPO for disposal, as required by AR 385-11 (U.S. Army, 1980a). [Subsequent to the site visit, it was reported that the installation has notified the U.S. Army Health Services Command, WBAMC's PVNTMED Activity, and an SOP is being developed to correct current procedures.]

Radioactive isotopes are stored and used in WBAMC by the Nuclear Medicine Service, the Clinical Investigation Service, the Radiation Therapy Service, and the Department of Pathology. No problems were identified with the use or storage of these materials.

DPDO stores hazardous materials in Bldg. 11122 while awaiting sale or disposal by a hazardous waste contractor. Typical items stored in this area include pesticides, solvents, and other chemicals.

3.1.13 POL HANDLING AND STORAGE

The SPCC/ISCP identified three major POL storage areas but does not provide a complete inventory of tank/drum storage locations and contents, contrary to specifications required by EPA (1982f) and U.S. Army (1982) regulations. [Subsequent to the site visit, it was reported that the SPCC/ISCP was updated in April 1983 and has been distributed.] The SPCC/ISCP does not specify a procedure or responsible organization for gaging, leak testing, or inspecting tanks. [Subsequent to the site visit, it was reported that the Environmental Protection Office, DEH, will develop a program in the near future which will cover all necessary precautions to prevent a spill of any kind (including underground tanks)].

Mobile storage of POL is not routinely practiced at FTBL, although it is employed during some major field exercises. At the airfield, tankers filled at Bldg. 11116 are taken to various points on taxiways and used to fuel aircraft. Military units utilize dispensing areas in the tactical equipment shop compounds to refuel tactical and support vehicles during daily operations. Procedures for use of mobile storage are not discussed in the SPCC/ISCP. [Subsequent to the site visit, it was reported that the SPCC/ISCP was updated in April 1983 and has been distributed.]

Evidence of minor spillage was found near drum storage areas and wash racks in several tactical vehicle shop areas.

3.1.14 SANITARY WASTEWATER TREATMENT

Sanitary wastewater from the cantonment area flows to the El Paso STP at a rate of 12 MLD. Range camps are served by complete retention oxidation ponds. Some outlying buildings are served by septic tanks.

3.1.15 INDUSTRIAL WASTEWATER TREATMENT

Industrial wastewater consists of vehicle wash rack discharges, battery acid neutralization discharges, and wet-curtain paint spray booth discharges. Vehicle wash racks are not routinely cleaned. As a result, wash rack discharges drain into the stormwater drainage system, in violation of EPA (1982a) and U.S. Army (1982) regulations. When in proper working order, wash racks discharge wash water to the sanitary sewer following filtration through an oil/water separator and grit trap. [Subsequent to the site visit, it was reported that a service contract was awarded to clean all wash racks and to put them in serviceable order. The fact that maintenance of wash racks is a troop responsibility was emphasized to units concerned.]

Liquid wastes, including sludges generated by battery acid neutralization and wet-curtain paint spray booth operations at DIO MRD, are discharged into drains. Discussions with post personnel and examination of engineering blueprints failed to reveal if these drains are connected to the sanitary or stormwater drainage system. If discharges occur to the stormwater system, the installation would be in violation of EPA regulations. [Subsequent to the site visit, it was reported that these operations discharge their wastewater into the city of El Paso's sanitary sewer. The disposal of battery acid has been discontinued, and undrained batteries are now being given to the Department of Energy for recycling.]

3.1.16 LANDFILL/DISPOSAL AREAS

Fourteen landfills and dumps are located on FTBL. The post currently operates a state-permitted sanitary landfill, while four rubble pits are operated at the ranges and outlying camps. The remainder of the landfills and dumps have been closed.

At the time of the site visit, materials were being properly disposed of in the sanitary landfill, with a daily cover emplaced in the evenings. Due to flat terrain and high winds, problems with blowing trash occur,

despite the fact that the landfill is entirely fenced with a 3.4-m high, chain-link fence. Signs forbidding unauthorized dumping were posted at closed dumping areas. No leachate is produced at FTBL landfills due to the low rainfall rate and high evaporation rates. Due to arid conditions, stabilizing vegetative cover is sparse and materials in several closed landfills were exposed due to wind erosion.

3.1.17 CONTAMINATED WASTES

Infectious solid waste from the hospital is autoclaved and sent to the sanitary landfill. Pathological wastes and dead animals are incinerated in Bldg. 7265.

3.1.18 DEMOLITION AND BURNING GROUND AREAS

The demolition of explosive wastes, unserviceable ammunition, and UXO at FTBL is performed by the 41st EOD. The 41st EOD operates a dedicated EOD range located due east of McGregor Range Camp, which contains two demolition sites. Explosives demolitions by the 41st EOD are conducted approximately 2 to 3 times per quarter. Approximately 907 kg of explosives are destroyed each quarter at the EOD range. HE artillery and mortar rounds, rocket motors, grenades, and bombs are generally blown where found. The EOD demolition range is operated under RCRA interim status as a hazardous waste thermal treatment facility. No sampling and analysis of demolition residues have been performed, contrary to EPA (1982b) regulations. [Subsequent to the site visit, it was reported that, in the near future, USAEHA will perform tests.]

Range clearance activities conducted by the 41st EOD include 3-year clearances at Dona Ana Ranges 40, 41, and 42; portions of Dona Ana and McGregor impact areas; and in select portions of maneuver areas.

Powder burning is conducted at the EOD range. No annual quantities are known. Limited unauthorized powder burning occurs at Dona Ana artillery firing points.

3.1.19 WATER QUALITY

Surface water on FTBL is restricted to seasonal playas, ephemeral streams, and oxidation ponds, for which water quality data are not available.

Subsurface water quality data are available for 17 wells used as sources of potable water on FTBL. The water is hard to very hard and generally conforms to NIPDWR and NSDWR standards. Violations of NIPDWR standards for lead have been noted in Wells 5 and 16, but the source of this contaminant has not been established. TDS and chloride concentrations exceed NSDWR criteria in some wells, reflecting the mineralized condition of the Hueco Bolson aquifer at those localities. The potential for the aquifer to be contaminated by surface materials is greatly restricted by a subsurface layer of caliche.

Water treatment consists of chlorine disinfection, augmented in some of the distribution systems by sand filtration, corrosion control, and softening. During 1972 to 1977, the maximum concentrations of lead, mercury, and iron observed in the FTBL distribution system exceeded the NIPDWR standards, and TDS concentrations exceeded NSDWR standards in the FTBL, Dona Ana, and city of El Paso distribution systems. The source of lead, mercury, and iron in the FTBL distribution system has not been established. The high TDS concentrations are a direct consequence of the well water composition.

3.1.20 AIR QUALITY AND NOISE

The El Paso area is a nonattainment area for ozone, particulate matter, carbon monoxide, and lead. While little ambient air quality monitoring data are available for FTBL, the absence of significant sources suggests that FTBL is not a major contributor to the region's poor air quality. Permits are not required of the installation's stationary sources. Noise levels on FTBL have been found to be less than in adjacent urban areas.

3.2 CONCLUSIONS

1. Available geological evidence, information on contaminant sources, and limited water quality data do not indicate the offpost migration of contaminants via surface or subsurface waters.
2. The following practices for handling material or for waste disposal, while not leading to offpost migration, are not in compliance with designated regulations:
   a. The current method of handling waste petroleum, oils, and lubricants does not ensure that hazardous wastes are not mixed with the waste petroleum, oils, and lubricants. This presents a potential safety risk to firefighting personnel which use the waste oil for training exercises, as well as being in violation of Resource Conservation and Recovery Act (EPA, 1982b) regulations for disposal of hazardous wastes.
   b. Waste motor oil generated by vehicle maintenance activities is being taken offpost for sale and/or recycling. At the time of the site visit, no official authorization or contract existed for this practice; however, the installation was working to establish a formal contract with a waste oil recycling company.
   c. Raytheon disposes of waste solutions containing unknown concentrations of chromium in a concrete tank near Bldg. 11605. These solutions have not been tested to determine if they are toxic/hazardous according to EPA (1982c) protocol. If classified as toxic/hazardous, this would constitute improper disposal of toxic/hazardous wastes (EPA, 1982b). At the time of the site visit, the U.S. Army Environmental Hygiene Agency was conducting an evaluation of this disposal operation, including sampling and analysis of soil and sludge samples.
   d. Pesticide storage facilities (Bldgs. 60-277, 1235, 11160, and 3007) lack continuous curbing, contrary to recommended EPA (1982h) procedures. In addition, Bldgs. 1235 and 3007 are not marked with toxic/hazardous materials storage warning signs, contrary to EPA (1982h) and U.S. Army (1980a) regulations.

e. Small quantities of pesticides are stored by the Directorate of Engineering and Housing Entomology Section in an area used for food consumption, contrary to EPA (1982h) and U.S. Army (1980a) regulations.

f. Pesticide-contaminated rinseates generated by the Directorate of Engineering and Housing Entomology Section and Grounds Maintenance Section are disposed of by open dumping, contrary to EPA (1982h) and U.S. Army (1980a) regulations. Several potable water sources used for mixing pesticides are not equipped with backflow-prevention devices.

g. Grounds Maintenance Section personnel involved in the application of herbicides are not certified, contrary to U.S. Army (1980a) regulations.

h. Polychlorinated biphenyls and polychlorinated-biphenyl-containing items are currently stored in a recently constructed facility (Bldg. 11614) which conforms to EPA (1982g) regulations, with the exception that the facility is not appropriately marked with signs indicating polychlorinated-biphenyl storage.

i. Polychlorinated-biphenyl-contaminated floor sweep is stored in Bldg. 11122, which does not conform to EPA (1982g) requirements for storage of polychlorinated biphenyls.

j. Unserviceable low-level radioactive supply items (rifle sights, compasses, etc.) used by various military units are not turned in to the Radiation Protection Officer for disposition, as required by Army Regulation 385-11 (U.S. Army, 1980b).

k. Underground petroleum, oils, and lubricants storage tanks are not properly leak checked, contrary to EPA (1982f) regulations.

l. The current Spill Prevention Control and Countermeasure/Installation Spill Contingency Plan does not meet specifications required by EPA (1982f) and U.S. Army (1982) regulations.

m. Wash racks are not routinely maintained, resulting in washwater discharges to the stormwater drainage system, in violation of EPA (1982a) regulations.

n. The disposition of battery acid neutralization and paint spray booth wastewater discharged to drains at the Directorate of Industrial Operations Materiel Readiness Division is not known. If these drains discharge to the stormwater drainage system, a National Pollutant Discharge Elimination System permit (EPA, 1982a) would be required.

o. The installation currently is not in compliance with EPA (1982b) regulations with regard to sampling and analysis of residues from explosives and ammunition demolition activities.

3.3 RECOMMENDATIONS

That USATHAMA should:

1. Not conduct a survey at this time.

That FTBL should:

2a. Institute a procedure to effectively segregate waste hazardous materials from waste petroleum, oils, and lubricants, and dispose of hazardous wastes in accordance with regulations.*

b. Continue with the current efforts to establish a formal contract with a waste petroleum, oils, and lubricants recycling/disposal company.*

c. Perform Resource Conservation and Recovery Act hazardous/toxic tests on the waste solutions generated by Raytheon and take appropriate action regarding future disposal methods; continue with the program to evaluate the degree of soil contamination, if any, in the vicinity of the disposal tank and take appropriate action.*

d. Continue with the plan to construct a proper pesticide storage facility. In the interim, place toxic/hazardous materials storage warning signs on all buildings in which pesticide chemicals are stored.*

e. Discontinue the practice of storing pesticides in areas where food is consumed.*

f. Discontinue the practice of open dumping pesticide-contaminated rinseates. Install backflow-prevention devices on potable water sources used for pesticide formulation.*

g. Obtain certification of Grounds Maintenance Section personnel involved in the application of herbicides.*

h. Install polychlorinated-biphenyl warning signs on the facility in which polychlorinated biphenyls are stored.*

i. Properly store polychlorinated-biphenyl-contaminated floor sweep.*

j. Institute a procedure for turn-in of unserviceable low-level radioactive supply items to the post Radiation Protection Officer for disposition, as required by Army regulations.*

k. Institute a program to properly test underground petroleum, oils, and lubricants storage tanks for leakage.*

l. Update the Spill Prevention Control and Countermeasure/ Installation Spill Contingency Plan to meet EPA and Army regulations.*

m. Properly maintain wash racks to ensure washwaters are not discharged to the stormwater drainage system.*

n. Determine the disposition of discharges from the drains at the Directorate of Industrial Operations Materiel Readiness Division used to dispose of battery acid neutralization wastewaters and paint spray booth wastewaters. If these drains discharge to the stormwater drainage system, take appropriate action to bring these discharges into compliance with EPA regulations.*

o. Bring the demolition sites into compliance with EPA regulations regarding sampling and analysis of demolition residues.*

*Subsequent to the site visit, the following actions have been reported by FTBL (Keyed to Recommendations):

a. The FTBL Hazardous Waste Management Plan restricts the contamination of used oil with hazardous waste so that all used oil can be recycled under the Resource Recovery Plan.

b. A used oil pickup contract (METRO Oil Corp., Tucson, Ariz., Contract No. 41-3250-002, effective dates: Apr. 8 to Sept. 30, 1983) has been instituted.

c. FTBL is currently in touch with the U.S. Army Environmental Hygiene Agency and the U.S. Army Training and Doctrine Command to evaluate all possible contamination.

d. In the near future, warning signs will be placed on all buildings in which pesticide chemicals are stored.

e. The practice of storing pesticides in areas where food is consumed has been discontinued.

f. Contaminated rinseates will be used as a solution base for preparation of further pesticide solutions.

g. Emphasis is being given to achieve the goal of certification for all personnel.

h. Warning signs have been posted on two sides of the building, the main door and the west side wall.

i. Polychlorinated-biphenyl-contaminated floor sweep is properly stored.

j. The installation has notified the U.S. Army Health Services Command, William Beaumont Army Medical Center's Preventive Medicine Activity, and a standing operating procedure is being developed to correct current procedures.

k. The Environmental Protection Office, Directorate of Engineering and Housing, will develop a program in the near future which will cover all necessary precautions to prevent a spill of any kind (including underground tanks).

l. The Spill Prevention Control and Countermeasure and Installation Spill Contingency Plans were updated in April 1983, and they have been distributed.

m. A service contract was awarded to clean all wash racks and to put them in serviceable order. The fact that maintenance of wash racks is a troop responsibility was emphasized to units concerned.

n. These operations discharge their wastewater into the city of El Paso's sanitary sewer. The disposal of battery acid has been discontinued, and undrained batteries are now being given to the Department of Energy for recycling.

o. In the near future, the U.S. Army Environmental Hygiene Agency will perform tests.

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APPENDIX A

TENANT ACTIVITIES AND LIAISON OFFICES ON FTRL

TENANT ACTIVITIES ON FTBL

1. American Red Cross
2. Defense Subsistence Office (El Paso)
3. Defense Investigative Service
4. El Paso USAR Center
5. FTBL District 6th Region USACIDC
6. USAINSCOM-FTBL
7. COE, Fort Worth
8. Army Research Institute
9. 101st Air Base Defense Flight
10. DARCOM LAO
    --ARRCOM
    --CECOM
    --MICOM, Targets Office, Hawk Field Office
    --TACOM
    --TSARCOM
    --ADCSS Software Support Center
    --Patriot Deployment Support Office
    --PM-DIVAD Gun System/Sgt. York Gun System
11. DPDO
12. U.S. Army Commissary
13. U.S. Army Audit Agency
14. U.S. Army Special Security Detachment
15. OSD Joint Forward Area Air Defense Test Directorate
16. USAOTEA Field Office
17. Nuclear Weapons Support Detachment
18. IFFN-JTF Detachment No. 1
19. U.S. Army Sergeant's Major Academy
20. Army Recruiting Command Liaison
21. COE, Albuquerque District
22. Defense Contract Administration Service Quality Assurance Office

23. German Air Force Training Command
24. USMC Corps Administrative Detachment
25. NAMSA Nike Training Center
26. National Guard Advisor
27. Patriot Software Support Group
28. USACC-FTBL
29. DENTAC
30. FESA-Detachment 111
31. WBAMC
32. 4166th USAR School
33. 4525th Combat Application Squadron
34. 3d Battalion-133d Field Artillery (Texas National Guard)
35. 12th Special Forces Group Army Reserve, Headquarters Company 2d Battalion
36. Evacuation Hospital, Detachment 1
37. Military Intelligence GP-IAGPA-C-BC
38. Area TMDE Support Team Calibration Services

Abbreviations:

USAR = U.S. Army Reserve.
USACIDC = U.S. Army Criminal Investigation Command
USAINSCOM = U.S. Army Intelligence and Security Command
TACOM = U.S. Army Tank-Automotive Command
TSARCOM = U.S. Army Troop Support and Aviation Materiel Readiness Command
ADCSS = Air Defense Command Simulation System
IFFN-JTF = Identification Friend, Foe, or Neutral Joint Force
NAMSA = NATO Maintenance and Support Activity
USACC = U.S. Army Communications Command
FESA = Facilities Engineering Support Activity

Sources: FTBL, 1983.
FTBL, 1982a.
ESE, 1983.

LIAISON OFFICES ON FTBL

USMC Representative
USAF Representative
Canada
Egypt
France
German Air Force Air Defense School
German Army
Japan
Kuwait
Netherlands
United Kingdom

Source: FTBL, 1983.

APPENDIX B
PHYSICAL DATA FOR FTBL WELLS

Table B-1. Physical Data for FTBL Wells

USGS Well No.	Date Opened	Depth (m)	Diameter (cm)	Yield (lpm)	Remarks
49-05-311	1951	228.6	--	567.9	
49-05-904	1958	254.2	--	4,164.6	Production
49-06-201	1953	243.8	--	3,028.8	Test well, destroyed
49-06-501	1953	306.3	7.62	--	Observation well
49-06-502	--	--	15.24	--	Oil well, abandoned
49-06-601	1953	96.3	7.62	--	Test well, dry
49-06-602	--	--	15.24	--	Destroyed
49-06-701	1959	249.6	60.96	5,947.8	
49-06-702	1952	137.1	15.24	--	Observation well
49-06-703	1952	167.6	15.24	--	Observation well
49-06-704	1940	301.7	--	--	Test well, filled
49-06-705	1940	291.6	--	--	Test well, filled
49-13-204	1941	279.5	60.96	--	
49-13-205	1937	243.8	15.24	--	Observation well
49-13-211	1939	346.5	--	--	Test well
49-13-213	1927	212.7	--	--	Test hole, abandoned
49-13-214	1927	252.9	--	--	Test hole, abandoned
49-13-302	1953	247.4	60.96	--	Supply well, abandoned
49-13-303	1956	243.5	66.04	--	Supply well
49-13-304	1953	247.4	60.96	4,543.2	
49-13-305	1953	248.7	60.96	4,543.2	
49-13-306	1941	289.5	10.16	--	Test well
49-13-307	1967	247.4	60.96	5,679	
49-13-310	--	121.9	25.4	--	
49-13-311	1973	248.4	60.96	3,812.5	
49-13-503	1942	279.1	60.96	3,293.8	
49-13-504	1931	239.2	60.96	--	
49-13-505	1969	245.6	60.96	--	
49-13-506	1953	275.8	10.16	--	Test well
49-13-507	1917	182.8	30.4	946.5	Plugged, abandoned
49-13-508	1913	198.7	25.4	--	Plugged, abandoned
49-13-509	1913	200.2	30.4	--	
49-13-510	1917	182.8	30.4	--	
49-13-511	1959	229.5	60.8	--	
49-13-512	1928	217.9	50.8	--	
49-13-515	1922	264.8	30.4	--	Abandoned
49-13-516	1937	262.1	30.4	2,650.2	
49-13-517	1937	262.1	30.4	2,362.4	
49-13-518	1921	263.3	30.4	2,498.7	
49-13-519	1941	259.6	40.6	2,006.5	
49-13-520	--	--	--	--	

Table B-1. Physical Data for FTBL Wells (Continued, Page 2 of 2)

USGS Well Numbers	Date Opened	Depth (m)	Diameter (cm)	Yield (lpm)	Remarks
49-13-601	1935	237.7	50.8	4,543.2	
49-13-602	1951	237.7	60.96	3,786	Plugged, abandoned
49-13-603	1961	236.2	60.96	3,786	
49-13-604	1938	277.0	60.96	6,436.2	
49-13-606	1941	237.1	50.09	4,732.5	
49-13-611	1936	121.9	5.09	--	Test well, plugged
49-13-612	1938	217.3	30.4	--	Test well
49-13-615	1967	243.8	60.96	--	
49-13-616	1951	237.7	60.96	4,793.0	Abandoned, casing pulled
49-13-619	1938	393.8	--	--	Test well
49-13-620	1931	340.4	--	--	Test well
49-13-621	1937	244.5	--	--	Test well
49-13-625	1977	312.7	60.96	--	
49-14-101	1959	249.6	60.96	6,227.97	
49-14-102	1952	123.1	7.62	--	Test well
49-14-103	--	68.5	20.3	--	Abandoned
49-14-104	1973	287.1	60.96	--	
49-14-105	1973	292.6	60.96	6,625.5	
49-14-201	1952	152.4	7.62	--	Observation well
49-14-301	1953	128.0	7.62	--	Test well, plugged
49-14-302	1940	--	17.78	68.1	
49-14-416	1973	289.5	60.96	7,572	
49-14-501	1953	289.5	--	--	Test well, plugged
49-14-502	1933	115.2	15.24	--	Plugged, covered
49-14-504	1967	152	45.72	83.2	
49-14-606	1974	134.1	20.32	140.0	
49-15-406	1975	134.1	25.4	--	
49-15-503	--	--	--	--	
49-15-504	1974	127.1	15.24	--	

-- = Not available.

Source: Compiled by EDE from 1980 State of Texas Geological Survey data.

APPENDIX C

LAND USE ON FTBL

9 Nov 82

FORT BLISS, TEXAS - BREAKDOWN:	ACRES - FEE OWNED	ACRES EXCLUSIVE USE LEASE	PUBLIC DOMAIN LAND	TOTAL
MAIN POST	3,150.92			3,150.92
LOGAN HEIGHTS	1,208.60			1,208.60
MAGAZINE AREA	320.97			320.97
WILLIAM BEAUMONT ARMY HOSPITAL	264.67			264.67
CASTNER RANGE	69.81			69.81
BIGGS AIRFIELD	6,022.11			6,022.11
MANEUVER AREA I	45,715.59			45,715.59
MANEUVER AREA II	44,500.25	16,960.00		61,460.25
TOTALS:	101,252.92	16,960.00	Total Acres Fort Bliss, TX = 118,212.92	
			SQ MILES 1,738.58	

C-1

FORT BLISS AAA RANGES NEW MEXICO:	ACRES - FEE OWNED	FOREST LAND (MU)	PUBLIC DOMAIN LAND	TOTAL
DONA ANA-HUECO-ORO GRANDE	60,141.65 **		236,865.40**	297,006.05
MCGREGOR & EXPANSION	71,083.28	18,004.00	608,384.72	697,472.00
TOTALS:	131,224.93	18,004.00	845,250.12	994,478.05

TOTAL ACRES:

FEE OWNED	232,477.85
EXCLUSIVE USE LEASE	16,960.00
PUBLIC DOMAIN	845,250.12
FOREST LAND (MU)	18,004.00
	1,112,691.97

** Breakdown of Dona Ana-Hueco-Oro Grande Ranges

Dona Ana & Hueco:	Fee Owned	5,729.31	Acres
	Public Domain	40,281.00	Acres
	Total	46,010.31	
Oro GRande:	Fee Owned	54,411.34	Acres
	Public Domain	196,594.40	Acres

REPORT OF COMPLIANCE INSPECTION - OUTGRANTS | INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS | DISTRICT: ALBUQUERQUE DISTRICT | DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
License	DA(s) 49-040-ENG-1	Mtn States T & T	Pub Tel Facs	11/01/50	Indef.	% returns			X
License	DA 49-040-ENG-5	Western Union	Telegraph Facs	12/24/56	Indef.	% returns			X
Easement	091-RE-G-4	SO Pac RR	R/W psgnr sta	11/23/1897	Indef.	None			X
Easement	091-RE-G-9	Mtn States T & T	Tel line for So Pac RR Company	03/27/26	Indef.	None			X
Easement	091-RE-G-12	Likins Foster Coop	R/W sewer line	10/04/51	10/03/2001	$100.00	F/T		X
Easement	091-RE-G-15	El Paso Elec Co.	R/W elec line .04 ac	08/15/51	08/14/2001	$10.00	F/T		X
Easement	091-RE-G-16	El Paso Elec Co.	R/W elec line .1 ac	08/15/51	08/14/2001	$100.00	F/T		X
Easement	091-RE-G-17	El Paso Elec Co.	R/W elec line	08/15/51	08/14/2001	$25.00	F/T		X
Easement	091-RE-G-18	Mtn States T&TAEP Elec Co.	R/W tel & elec line	03/03/50	03/02/2000	$225.00	F/T		X
Easement	091-RE-G-19	El Paso Elec Co.	R/W elec line .768 ac	09/03/52	09/02/2002	$175.00	F/T		X
Easement	091-RE-G-20	County of El Paso	R/W road	03/08/29	Indef.	None			X
Easement	091-RE-G-21	County of El Paso	R/W road	08/04/21	Indef.	None			X
Easement	091-RE-G-22	County of El Paso	R/W road drain 56.01 ac	08/04/21	Indef.	None			X
Easement	091-RE-G-23	County of El Paso	R/W road	04/01/30	Indef.	None			X

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REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Easement	091-RE-G-24	County of El Paso	R/W road 2.82 ac	04/30/36	Indef.	None			X
Easement	091-RE-G-25	County of El Paso	R/W road	02/06/34	Indef.	None			X
Easement	091-RE-G-27	City of El Paso	R/W elec & water line .59 ac	09/17/52	09/16/2002	None			X
Easement	091-RE-G-29	City of El Paso	R/W water lines	09/21/29	Indef.	None			X
Easement	091-RE-G-33	El Paso Elec Co.	R/W elec line .77 ac	07/03/51	07/02/2001	$250.00	F/T		X
Easement	091-RE-G-38	El Paso Nat'l Gas	R/W gas pipeline 15.5 ac	05/05/55	05/04/2005	$4,100.00	F/T		X
Easement	091-RE-G-39	City of El Paso	R/W for street	05/13/55	Indef.	None			X
Easement	091-RE-G-40	El Paso Elec Co.	R/W elec trans line 2 ac	05/31/55	05/30/2005	$410.00	F/T		X
Consent/Easement	091-RE-G-42	Mtn States T&T	R/W tel line	04/07/55	Indef.	None			X
Easement	091-RE-G-44	El Paso Elec Co	R/W elec line	08/24/55	08/23/2005	$650.00	F/T		X
Easement	091-RE-G-45	Mtn States T&T	R/W tel line .75 ac	10/17/55	10/16/2005	$325.00	F/T		X
Easement	091-RE-G-47	City of El Paso	R/W drainage ditch 24.8 ac	02/21/56	02/20/2006	None			X
Easement	091-RE-G-51	El Paso Elec Co.	R/W elec	04/13/56	04/12/2006	$60.00	F/T		X

REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Easement	AF41(018)-66	SU Gas Co.	R/W gas pipeline	10/05/50	10/04/2025	$10.00	F/T		X
Easement	AF41(018)-67	City of El Paso	R/W sewer line	10/05/50	10/04/2025	$10.00	F/T		X
Easement	AF41(018)-92	El Paso Elec Co	R/W elec line	04/26/51	04/25/2001	$10.00	F/T		X
Easement	091-RE-G-390	City of El Paso	R/W sewer .09 ac	09/14/56	09/13/2006	None			X
Easement	091-RE-G-400	City of El Paso	R/W water pipeline 2.15 ac	09/20/56	09/19/2006	None			X
Easement	091-RE-G-442	El Paso Elec Co.	R/W elec powerline 3.8 ac	03/28/57	03/27/2007	$750.00	F/T		X
Easement	091-RE-G-450	El Paso Elec Co.	R/W elec transline 6.0 ac	04/23/57	04/22/200[illegible]	$600.00	F/T		X
Easement	091-RE-G-455	Pasotex Pipeline	R/W fuel pipeline 11 ac	05/22/57	05/21/2007	$2,400.00	F/T		X
Easement	091-RE-G-462	El Paso Elec Co	R/W elec line 31.26 ac	07/24/57	07/23/2007	$4,550.00	F/T		X
Easement	091-RE-G-489	City of El Paso	R/W water line .16 ac	02/10/58	02/09/2008	None			X
Easement	091-RE-G-493	SU Gas Co	R/W gas line .7 ac	04/21/58	04/20/2008	$1,000.00	F/T		X
Easement	091-RE-G-511	City of El Paso	Fld Control Dam 6.8 ac	07/16/58	07/15/2008	None			X
Easement	091-RE-G-516	City of El Paso	R/W water line 2.42 ac	09/03/58	09/02/2008	None			X

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REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Easement	DA91-RE-G-517	Pasotex Pipelin	R/W petro pipeline 6.22 ac	09/11/58	09/10/2008	$1,400.00	F/T		X
Easement	DA29-005-ENG-705	SU Gas Co	R/W gas pipeline	03/17/49	03/16/99	$10.00	F/T		X
Easement	DA29-005-ENG-1489	Salt Lake Pipeline	R/W petro pipeline 66.44 ac	04/08/55	04/07/2005	$10,660.00	F/T		X
Easement	DA29-005-ENG-1638	SoFac Pipeline	R/W petro pipeline 13.22 ac	10/03/55	10/02/2005	$7,000.00	F/T		X
Lease	DA29-005-ENG-1990	El Paso Ind School Dist	Land for school 8.16 ac	10/04/57	10/03/2032	$1,700.00	P/A		X
Easement	W49-040-ENG-2218	Mtn St T&T&EP Elec Co.	R/W tel & elec line	05/30/44	05/29/94	None			X
Easement	DA29-005-ENG-2291	El Paso Ntl Gas	R/W mtrg sta .03 ac	11/25/58	11/24/2008	None			X
Easement	DA29-005-ENG-2312	City of El Paso	R/W road 10.38 ac	03/18/59	Indef.	None			X
Easement	DA29-005-ENG-2316	City of El Paso	R/W water line .99 ac	01/15/59	01/14/2033	None			X
Easement	DA29-005-ENG-2349	El Paso Natl Gas	R/W mtrg sta .02 ac	04/30/59	04/29/2009	$50.00	F/T		X
Lease	DA29-005-ENG-2359	El Paso Natl Gas	R/W gas mtrg sta. .02 ac	12/08/58	12/07/83	$70.00 LS	P/A		X
Lease	DA29-005-ENG-2362	El Paso Ind School Dist.	Land for school 6.851 ac	07/01/59	06/30/2034	$960.00	P/A		X

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REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Easement	DA29-005-ENG-2367	El Paso Natl Gas	R/W gas pipeline 21.78 ac	03/26/59	03/25/2009	None			X
Easement	DA29-005-ENG-2450	El Paso Elec Co	R/W elec powerline	10/14/59	10/13/2009	None			X
Easement	DA29-005-ENG-2573	City of El Paso	R/W road .52 ac	04/25/60	Indef.	None			X
Easement	DA29-005-ENG-2618	County of El Paso	R/W road 7.99 ac	07/18/60	Indef.	None			X
Easement	DA29-005-ENG-2680	County of El Paso	R/W road .73 ac	11/25/60	Indef.	None			X
Easement	DA29-005-ENG-2830	City of El Paso	R/W road .22 ac	03/09/61	Indef.	None			X
Easement	DA29-005-ENG-2837	El Paso Elec Co	R/W elec guy & anchor	07/06/61	07/05/2001	$50.00	F/T		X
Easement	DA29-005-ENG-2848	El Paso Elec Co	R/W elec powerline .13 ac	05/01/61	04/30/2011	$225.00	F/T		X
Easement	DA29-005-ENG-3078	City of El Paso	R/W road 3.90 ac	08/23/61	Indef.	None			X
Easement	DA29-005-ENG-3079	City of El Paso	R/W road 2.52 ac	08/23/61	Indef.	None			X
Easement	DA29-005-ENG-3089	City of El Paso	Flood control dam 253.05 ac	08/29/61	08/28/2011	None			X
Easement	DA29-005-ENG-3100	El Paso Natl Gas	R/W gas pipeline 17 ac	10/03/61	10/02/2011	$937.50	F/T		X
Easement	DA29-005-ENG-3146	El Paso Natl Gas	R/W gas mtrg sta .02 ac	10/20/61	10/19/2011	$50.00	F/T		X

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REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Easement	DA29-005-ENG-3155	City of El Paso	R/W road 1.43 ac	11/20/61	Indef.	None			X
Easement	DA29-005-ENG-3155	El Paso Natl Gas	R/W gas pipeline 26.95 ac	11/20/61	11/19/2011	$1,480.00	F/T		X
Easement	DA29-005-ENG-3189	City of El Paso	R/W road 13.34 ac	01/15/62	Indef.	None			X
Easement	DA29-005-ENG-3441	City of El Paso	R/W road drainage .01 ac	06/29/62	06/28/2012	None			X
Easement	DA29-005-ENG-3462	El Paso Elec Co.	R/W elec powerline .61 ac	07/12/62	07/11/2012	None			X
Easement	DA29-005-ENG-3735	El Paso Elec Co	R/W elec powerline	02/01/63	01/31/2013	$145.00	F/T		X
Easement	DA29-005-ENG-4770	NM SHD	R/W road 121.95 ac	10/13/64	Indef.	None			X
Easement	DA29-005-ENG-4796	So Pac pipeline 12 ac	R/W petro pipeline	10/15/64	10/14/2014	$3,490.00	F/T		X
Easement	DA29-005-ENG-4828	El Paso Elec Co	R/W elec trans line 6.9 ac	12/01/64	11/30/2014	$1,750.00	F/T		X
Easement	W41-038-ENG-5242	El Paso Natl Gas	R/W gas pipeline	03/05/47	Indef.	$2,200.00	F/T		X
Easement	DA29-005-ENG-5250	City of El Paso	R/W sewer line .33 ac	02/11/E6	02/10/2016	None			X
Easement	DA29-005-ENG-5311	Htn States T&T	R/W U/G tel line 8.47 ac	05/16/91	05/15/31	$2,700.00	P/A		X
			R/W N-S Freev 186.51 ac	03/28/66	Indef.	None			X

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REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Easement	DA29-005-ENG-5333	El Paso Elec Co.	R/W elec line .01 ac	06/16/66	06/15/2016	$35.00	F/T		X
Easement	DA41-038-ENG-5341	Mtn States T&T&EP Elec Co	R/W tel and elec line	03/25/47	03/24/97	$11.00	F/T		X
Easement	DACA47-2-67-16	El Paso Elec Co	R/W elec Trans line 65.5 ac	11/22/66	11/21/2016	$710.00	F/T		X
Easement	DACA47-2-67-21	City of El Paso	R/W elec Trans line 1 ac	12/05/66	12/04/2016	None			X
Permit	DACA47-4-67-32	DCAS	Bldg 122 North end	01/11/82	01/10/87	None			X
Permit	DACA47-4-67-52	FAA	R/W elec powerline 9.02 ac	03/13/82	03/12/87	None			X
Permit	DACA47-4-67-54	FAA	Radar cntrl facs 1.95 ac	05/31/82	05/30/87	None			X
Permit	DACA47-4-67-55	FAA	R/W elec powerline	06/01/82	05/31/87	None			X
License	DACA47-3-68-40	Civil Air Patrol	Use 3 Bldgs.	11/21/67	11/20/82	None			X
Permit	DACA47-4-68-45	Dept of Comm	R/W U/G Cable	12/12/67	12/11/82	None			X
Permit	DACA47-4-68-68	FAA	R/W powerline	01/11/68	01/13/83	None			X
Permit	DACA47-4-68-69	FAA	R/W powerline	03/27/68	03/26/83	None			X
Permit	DACA47-4-68-70	Dept of Comm	R/W powerline & Collometer	02/01/68	01/31/83	None			X

REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Lease	DACA47-1-69-59	Mtn States T&T	Use of Gov't Poles	01/01/68	12/31/83	$24.00	P/A		X
Easement	DACA47-2-69-214	City of El Paso	R/W traf signals .1 ac	01/13/69	Indef.	None			X
Easement	DACA47-2-69-241	El Paso Natl Gas	R/W gas pipeline 63.5 ac ✓	02/14/69	02/13/2019	$3,350.00	F/T		X
Easement	DACA47-2-69-330	City of El Paso	R/W road 7.1 ac	04/08/69	Indef.	None			X
Easement	DACA47-2-69-344	FAA	VORTAC fac 323.38 ac	04/01/69	03/31/89	None			X
Easement	DACA47-2-70-71	El Paso Natl Gas	R/W gas pipeline 9 ac	08/27/69	08/26/2019	$200.00	F/T		X
Lease	DACA47-1-70-126	Mtn States T&T	Use Gov't poles	10/15/69	10/14/84	$11.00	P/A		X
Easement	DACA47-2-70-145	El Paso Elec Co	R/W elec line	10/29/69	10/28/2019	$5,000.00	F/T		X
Easement	DACA47-2-70-174	El Paso Elec Co	R/W anchor assy	12/10/69	12/09/2019	$20.00	F/T		X
Permit	DACA47-4-70-270	Dept of Comm	U/G util line .68 ac	03/28/70	03/27/85	None			X
Easement	DACA47-2-70-296	City of El Paso	R/W sewer line	06/19/70	06/18/2020	None			X
Permit	DACA47-4-70-297	FAA	Localizer site 2.3 ac	07/01/70	05/30/85	None			X
Permit	DACA47-4-70-299	Dept of Comm	Access road .08 ac	05/12/70	05/11/85	None			X
Permit	DACA47-4-71-1	Dept of Comm	U/G util line .2 ac	04/22/70	04/21/83	None			X

REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Easement	DACA47-2-71-69	City of El Paso	R/W flood drainage 1.977 ac	10,27/70	10/26/2070	None			X
Easement	DACA47-2-71-86	City of El Paso	R/W N-S frwy 199.6 ac	11/25/70	Indef.	None			X
Lease	DACA47-1-71-124	St. Natl Bank	Bldg 7111 - Bnkg purp	03/31/70	02/28/85	$530.00	P/A		X
Lease	DACA47-1-71-127	El Paso Natl Bank	Bldg 7111 - Bnkg purp	03/01/70	02/28/85	$650.00	P/A		X
Permit	DACA47-4-71-191	FAA	AC road to VORTAC 2.8 ac	06/10/71	06/09/86	None			X
Permit	DACA47-4-71-201	FAA	Radio Site 1.28 ac 3.3949	05/01/71	04/30/86	None			X
Lease	DACA47-1-72-22	Credit Union	Land for Bldg X ac	3/1/80 ~~06/15/71~~	2/28/2005 ~~06/14/81~~	~~$1,086.00~~ $20,600.00	P/A		X
Easement	DACA47-2-72-67	City of El Paso	Flood Prot (N gate) 416.4 ac	10/13/71	Indef.	None			X
Easement	DACA47-2-73-51	El Paso Elec Co	R/W elec powerline .5 ac	09/08/72	09/07/2022	$50.00	F/T		X
Easement	DACA47-2-73-89	El Paso Elec Co.	R/W elec powerline & substa	11/07/72	03/19/2020	$250.00	F/T		X
Easement	DACA47-2-73-95	City of El Paso	R/W street .6 ac	11/06/72	Indef.	None			X
License	DACA47-2-73-96	NM Natl Guard	Trng Area 80.6 ac	03/01/70	02/28/95	None			X
Permit	DACA47-4-73-108	Def Investg Svc	Bldg 11197	01/15/73	01/14/83	None			X

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REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	P/A	YES	NO
Easement	DACA47-2-73-113	El Paso Elec Co	R/W elec powerline 1.4 ac	01/18/73	07/23/2007	None			X
~~Permit~~	~~DACA47-4-73-128~~	~~USMC~~ Expired 15 Nov 81	~~Rtr pool 9.1 ac~~	~~02/21/73~~	~~02/28/83~~	~~None~~			~~X~~
Lease	DACA47-1-74-2	City of El Paso	Fire Alarm Circuit	07/01/73	06/30/83	None			X
Easement	DACA47-2-74-37	El Paso Elec Co	R/W reptr site	10/16/73	10/15/2023	$300.00	P/A		X
License	DACA47-3-74-74	Amer Natl Red Cross	Bldg 45	11/17/73	11/16/83	$1.00	F/T		X
Permit	DACA47-4-75-10	Def Sup Ag	Lands & Bldg 4.5 ac	~~09/04/74~~	08/31/84	None			X
Permit	DACA47-4-75-53	Def Contr Audit Ag	Bldg 902 - 1080 SF	10/01/74	09/30/84	None			X
Easement	DACA47-2-75-142	City of El Paso	Fld Control Pershg Dam 59.6 ac	04/03/75	Indef.	None			X
Easement	DACA47-2-75-162	NM SHD	R/W road 36.5 ac	07/24/75	Indef.	None			X
Easement	DACA47-2-75-160	Pierce, Pace, El Paso Ltd	R/W drwy .19 ac	08/29/75	Indef.	$2,332.00	F/T		X
Lease	DACA47-1-75-169	Mtn States T&T	Bldg 504A - 1492 SF	02/21/75	02/20/85	$2,700.00	P/A		X
Permit	DACA47-4-76-80	FAA	Outer Mrkr & Acc Road 8.4 ac	01/01/76	12/31/85	None			X
Easement	DACA47-2-77-26	So Pac Pipeline Inc	Cath Prot Sys .46 ac	11/30/76	10/14/2014	$100.00	F/T		X
Easement	DACA47-2-77-48	City of El Paso	Fort Bliss Div Channel	06/17/77	Indef.	None			X

REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
License	DACA47-3-77-51	City of El Paso	Const Area (Loc Prot Proj) .29 ac	04/15/77	04/14/84	None			X
Lease	DACA47-1-77-52	Rio Cablevision Inc.	Two Bldgs. 1480 & 890	04/15/82	04/14/87	$3,425.00	P/A		X
Easement	DACA47-2-77-57	El Paso Elec Co	Elec Transmission Line	05/02/77	05/01/2027	$100.00	F/T		X
Easement	DACA47-2-78-44	City of El Paso	Access Road & Sewer Line to Oxid Pond 1.54 ac	11/21/77	11/20/2027	None			X
License	DACA47-3-78-128	Texas Highway Dept	Borrow Mat Ponding Area	01/01/78	12/31/82	None			X
Permit	DACA47-4-78-139	Dept of Navy	Occupy & Maintain Land for const. of Perm Naval & Marine Center 10M 345 KV powerline 7 ac	03/01/78	02/28/2003	None			X
Easement	DACA47-2-78-147	El Paso Elec Co	Dona Ana Range 81.8 ac	07/31/78	07/30/2028	$3,440.00	F/T		X
Easement	DACA47-2-78-149	City of El Paso	10M 24" water main along Airport Road	03/30/78	03/29/2023	None			X
Easement	DACA47-2-78-156	El Paso Elec Co	10M Elec powerline pole	06/07/78	06/06/2028	$50.00	F/T		X
Easement	DACA47-2-78-157	City of El Paso Public Service Board	0M Sewer Pipeline	04/19/78	04/18/2028	None			X

REPORT OF COMPLIANCE INSPECTION - OUTGRANTS	INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS	DISTRICT: ALBUQUERQUE DISTRICT	DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM		RENTAL		CORRECTIVE ACTION RECOMMENDED	
				FROM	TO	AMOUNT	PER	YES	NO
Easement	DACA47-2-78-178	El Paso Elec Co	COM 24KV Elec Line Dona Ana Range	05/12/78	Indef.	None			X
Easement	DACA47-2-79-06	Mtn States T&T	COM underground cable	11/01/78	10/30/83	$25.00	F/T		X
Permit	DACA47-4-79-19	Treas Dept.	Bldgs. 10001 & 10002	12/19/82	12/18/83	None			X
Easement	DACA47-2-80-07	El Paso Elec Co	R/W IOM Elec Dist Line .11 ac	04/23/80	04/22/2030	None			X
Easement	DACA47-2-80-27	El Paso Elec Co	IOM 115 KV elec trans line 5.43 ac	12/21/79	12/20/2029	$2,170.00	F/T		X
~~Permit~~	~~DACA47-4-80-50~~	~~Dept of the Interior Fish and Wildlife~~	~~Use, Occupy & Maintain Bldg. 2040 for stg.~~ →	~~03/01/80~~	~~02/28/85~~	~~None~~			~~X~~
			REPLACED BY DACA47-4-83-10						
License	DACA47-3-80-106	State of Texas ANG	Bldg 11176 - 14,472 SF	06/01/80	05/31/85	None			X
Easement	DACA47-2-80-134	El Paso Elec Co	IOM 14 KV elec feeder line 0.247 ac	05/30/80	05/29/2030	$50.00	F/T		X
Lease	DACA47-1-80-148	Mtn States T&T	Attachment cables, fixtures on 106 Gov't owned poles, Aerovista	07/01/79	06/30/84	$10.00	P/A		X
~~Lease~~	~~DACA47-1-81-23~~	~~ADC Federal Credit Union~~	~~Construct Drive-up Teller~~	~~03/01/80~~	~~02/28/05~~	~~$6,400.00~~	~~P/A~~		~~X~~
			terminated - cross reference w/DACA47-1-77-23						
Easement	DACA47-2-81-0026	El Paso Public S/c Board	OM Water Pipeline	01/02/81	01/01/2005	None			X

C-13

C-14

REPORT OF COMPLIANCE INSPECTION - OUTGRANTS | INSTALLATION OR PROJECT AND LOCATION: FORT BLISS, TEXAS | DISTRICT: ALBUQUERQUE DISTRICT | DATE OF INSPECTION: 11 June 1982

TYPE OF INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM FROM	TERM TO	RENTAL AMOUNT	RENTAL P&R	CORRECTIVE ACTION RECOMMENDED YES	CORRECTIVE ACTION RECOMMENDED NO
Lease	DACA47-1-81-00031	State Nat'l Bank	ION ATM 176 sq. ft.	02/15/81	02/14/86	$176.00	P/A		X
Lease	DACA47-1-81-00032	State Nat'l Bank	ION ATM 32 sq. ft.	02/15/81	02/14/86	$32.00	P/A		X
Easement	DACA47-2-81-00049	Mtn States T&T	OM underground conduit 11 [illegible] Aerovista	04/14/81	04/13/2031	$150.00	F/T		X
Lease	DACA47-1-81-00056	El Paso Natl Bank	CO Banking facility Bldg 1720	06/20/81	06/19/2006	$9.250.00	P/A		X
Lease	DACA47-1-82-3	State Natl Bank	CO Banking facility 316' x 225', 71,100 SF	01/01/82	12/31/07	$9,250.00	P/A		X
	DACA47-1-[illegible]	[illegible]	[illegible] 1476	5/1/82	5/21/35				
LICENSE	DACA47-3-82-81	YMCA	USE OF Bldg 7089	10/1/82	10/1/87	NONE			
EASEMENT	DACA47-2-82-87	~~PUBLIC SERVICE BOARD EL PASO ELECTRIC CO.~~	ACCESS RD & UTILITY LINE WASTEWATER TREATMENT	1 SEP 82	11/20/2027				
LICENSE	DACA47-3-82-88	UNIV TEXAS AT EL PASO	RESEARCH / DORA ANN	1 SEP 82	31 AUG 83				
LEASE	DACA47-1-82-96	STATE NATL BANK	ATM - BLDG 2433	5 MAY 82	4 MAY 87	$100.00	P/A		
LEASE	DACA47-1-83-4	FORD AEROSPACE DIVAD	USE OF 2 ACRES NORTH MCGREGOR	1 SEP 82	31 AUG 87	$200.00	P/A		
PERMIT	DACA47-4-83-10	DEPT OF INTERIOR FISH & WILDLIFE	BLDG 2040 USE OF PORTION	1 MAR 82	28 FEB 85				
PERMIT	DACA47-4-83-11	INTERNAL REVENUE SERVICE	USE OF BLDG 2040	1 MAR 82	28 FEB 85				
LICENSE	DACA 47-2-82-18	YMCA	USE OF 146,250 SF FOR YMCA FACILITY	16 MAR 82	15 MAR 2057	Ø			

The outgrants listed above have been visually inspected and noted particularly as to maintenance, repair, condition of property, utilization, additions or alterations, and for any unauthorized use, transfer or assignment of interest. The grantees are complying with the terms of the respective instruments in all cases which show no corrective action recommended (cases shown as recommending corrective action, indicate discompliance in some respects, and a separate report on ENG Form 3131 is attached).

RECOMMENDED (Signature of Chief, Real Estate Division)	SIGNATURE OF INSPECTOR	INSPECTED WITH (If Applicable)		
		NAME	TITLE	TELEPHONE NO.
L. A. GUENTHER, Ch, Real Estate Division	LEONARD A. CARTER	Raul Castenada	Realty Specialist	18-478-3034

DA FORM 3560 (ER 405-1-800) | SHEET ___ OF ___

OUTGRANTS | FORT BLISS, TEXAS

INSTRUMENT	CONTRACT NUMBER	GRANTEE	PURPOSE	TERM FROM	TERM TO	RENTAL
LEASE	DACA47-1-83-6	CREDIT UNION	3 ATM's	1 Oct 82	30 SEP 87	$300.00 P/A

APPENDIX D

TRAINING AREAS AND RANGES ON FTBL

Table D-1. Training and Range Facilities of Meyer Range Complex

1. Ranges 1 and 1A. Individual tactical training, day and night.

2. Ranges 2, 3, and 4. Handgrenade courses.

   a. Range 2--Handgrenade assault course (practice grenades only).
   b. Range 3--Distance and accuracy course (practice grenades only).
   c. Range 4--Live handgrenade course (total of 10 live bays).

3. Range 5. Overhead Fire and Attack Course. A live overhead firing attack course consisting of two M-60 machinegun positions. Range 6 - inactive.

4. Range 7. Record Fire Range. A live-fire, 16-point qualification range consisting of M31A1 target-holding devices with silhouettes at 50-m intervals, at ranges of 50 to 300 m.

5. Range 8. Record Fire Range. A live-fire, 16-point qualification range consisting of M31A1 target-holding devices with silhouettes at 50-m intervals, at ranges of 50 to 300 m.

6. Range 9. Pistol Range. 25-point live-firing range for 25-m bull's-eye pistol targets mounted on stationary wooden frames. Sighting, aiming, and firing procedures and annual pistol qualification may be conducted.

7. Range 10. Field Fire Range. 35-point live-firing ranges with popup targets at 75, 175, and 300 m. Designed to train the individual in range estimation and holdoff firing at various targets from alternate positions and locations. Both stationary and popup targets are used.

8. Range 11. Corrective Fire Range. 25-point live fire range for remedial training in sighting, aiming, and firing procedures. Stationary targets at 25 m only.

9. Range 12. Field Firing Range (Night Fire Range). 35-point live-firing ranges with popup targets at 75, 175, and 300 m. Designed to train the individual in range estimation and holdoff firing at various targets from alternate positions and locations. Both stationary and popup targets are used.

10. Range 13. Corrective Fire Range. 25-point live-fire range for remedial training in sighting, aiming, and firing procedures. Stationary targets at 25 m only.

11. Range 14. Field Firing Range. 35-point live-firing ranges with popup targets at 75, 175, and 300 m. Designed to train the individual in range estimation and holdoff firing at various targets from alternate positions and locations. Both stationary and popup targets are used.

Table D-1. Training and Range Facilities of Meyer Range Complex
(Continued, Page 2 of 2)

12. Range 15. Corrective Fire Range. 25-point fire range for remedial training in sighting, aiming, and firing procedures. Stationary targets at 25 m only.

13. Range 16. Field Firing. 35-point live-firing ranges with popup targets at 75, 175, and 300 m. Designed to train the individual in range estimation and holdoff firing at various targets from alternate position and locations. Both stationary and popup targets are used.

14. Range 17. Preliminary Firing Training Range. 110-point live-fire range used for zeroing of M-16 rifles, stationary targets at 25 m. Designed to teach the individual to apply the principles of proper sight picture, sight alignment, positions, and the eight steady-hold factors. Also used for battle-sight zero. Silhouette targets are mounted on stationary wooden frames.

15. Range 18. Preliminary Firing Training Range. 110-point live-fire range used for zeroing of M-16 rifles, stationary targets at 25 m. Designed to teach the individual to apply the principles of proper sight picture, sight alignment, positions, and the eight steady-hold factors. Also used for battle-sight zero. Silhouette targets are mounted on stationary wooden frames.

16. Range 19. U.S. Weapon/Foreign Weapons Range.

    a. Range for firing M-60 machinegun, LAW, subcaliber LAW, and other U.S. weapons.
    b. Range for firing Soviet weapons and other foreign weapons.

17. Range 20. M-60 and .45-cal automatic familiarization.

18. Range 21. Fire and Maneuver Range (Dry). A 10-lane range, with M30A1 (popup) target devices and 6 machinegun simulators, used to conduct individual training.

19. Range 22. Fire and Maneuver Range (Wet). A 10-lane range, with M30A1 (popup) target devices and 6 machinegun simulators, used to conduct individual training.

20. Range 23. Target Detection Range. Nonfiring range used to train the individual in target detection and range estimation.

21. Range 24. Target Detection Range. Nonfiring range used to train the individual in target detection and range estimation.

22. Range 25. NBC/CB Training and Gas Chambers. One gas chamber is used for CS agent, and a second chamber is used for CS and CN agents.

Source: FTBL Range Command, 1981b.

Table D-2. Dona Ana Ranges and Range Descriptions

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1. Dona Ana 40A, Control Tower CF 555655, and Cantonment Area CF 538653.

   a. Primary use. Tank Tables VII and VIII, combination moving and stationary tank range.
   b. Secondary use. Range for 20- and 40-mm, Tank Tables IX ad X, Tactical Helicopter Gunnery Range.
   c. Weapons authorized.

      (1) 105 main gun.
      (2) 155-mm; written approval from Commander Range Command is required.
      (3) 4.2-in mortar.
      (4) 5.56-mm, machinegun.
      (5) 81-mm mortar.
      (6) 165-mm; written approval from Commander Range Command is required.
      (7) .50-cal machinegun.
      (8) 7.62-mm machinegun and minigun.
      (9) 20-mm and 40-mm air defense weapons.
      (10) .30-cal machinegun.
      (11) 1.75 FFAR.
      (12) TOW missile.

   d. Description. A combination moving and stationary target tank range with 9 targets for main guns, machineguns.

2. Dona Ana 40B

   a. Primary use. Zero-range main gun (Tank Table VIII).
   b. Secondary use. Small arms familiarization.
   c. Weapons authorized.

      (1) 105-mm.
      (2) 152-mm.
      (3) M-60.
      (4) .50-cal.
      (5) Small arms.

   d. Description. Open area 1,200-m deep with zero panels located midway up the mountain wall. Target repair buildings located to the rear and flank of firing line.

3. Dona Ana 41, Engineer Training Area, CF 5159/5359/5161/5361.

   a. Primary use. Engineer construction, demolition, and evacuation training range.
   b. Secondary use. None.
   c. Weapons authorized. All types of demolition to include Claymore mines and Shape charges.

Table D-2. Dona Ana Ranges and Range Descriptions (Continued, Page 2 of 7)

d. Description. Rolling terrain area 2 km^2. Southeast corner of the training area includes Dona Ana Range 1, which has cement observation bunkers (good for close-in training observation). Land-line communication is also available at the southeast facility and should be used when training is confined to that area. All other training will require FM radio communications with Dona Ana Range Control (FM 41.5).

4. Dona Ana 42, CF 545555 (center of range).

a. Primary use. Artillery indirect fire.
b. Secondary use. None.
c. Weapons authorized.

(1) 105-mm.
(2) 155-mm.
(3) 8-in.
(4) 4.2-in mortar and 81-mm mortar.

d. Description. There are 44 firing points marked by 4-in by 4-in concrete pad with a shell case in center. Specific firing areas on the range will be assigned each user. Field fire terminals are located at all operation patrols and road guard points.

5. Dona Ana 43, CF 584580.

a. Primary use. Zeroing.
b. Secondary use. Tank Tables I and II.
c. Weapons authorized.

(1) M-60 machinegun (familiarization and zeroing).
(2) 7.62-mm, tank-mounted.
(3) .45-cal automatic weapons.
(4) Shotgun familiarization.
(5) 20-mm.
(6) 40-mm.
(7) 4.2-in mortar.

d. Description. Range consists of one control tower and firing points for the weapons listed above. Control tower has secondary potential as operation patrol for Dona Ana 42.

Table D-2. Dona Ana Ranges and Range Descriptions (Continued, Page 3 of 7)

6. Dona Ana 44, CF 586582.

   a. Primary use. Small arms familiarization range.
   b. Secondary use. Tank Table III.
   c. Weapons authorized.

      (1) Vehicular-mounted machineguns.
      (2) Shotguns.

   d. Description. Machine gun moving-target range with 10 moving targets, 60-m firing range. Used for Tank Table III.

7. Dona Ana 45, CF 588577.

   a. Primary use. Known-distance rifle firing.
   b. Secondary use. Rifle marksmanship firing (team qualification).
   c. Weapons authorized.

      (1) Rifle 7.62-mm.
      (2) Rifle 5.56-mm.
      (3) M-60 machinegun.

   d. Description. There are 40 firing points at 100, 200, 300, 500, and 600 yards. Each push-pull target is numbered and corresponds to the respective firing points. Range flag CF 589577.

8. Dona Ana 46, CF 601588.

   a. Primary use. USARADBD weapons tests.
   b. Secondary use. M-31 Simulator (14.5-mm Trainer Field Artillery Subcaliber Firing Range).
   c. Weapons authorized.

      (1) To be determined by Commander, Range Command.
      (2) 14.5-mm.

   d. Description. An evaluation range for firing and testing ADA automatic weapons, small guided air defense missiles, 14.5-mm projectiles, and other weapons.

9. Dona Ana 47, CF 604596 to CF 615598.

   a. Primary use. FAW and automatic weapons fire, ground and aerial.
   b. Secondary use. Mortar firing.

Table D-2. Dona Ana Ranges and Range Descriptions (Continued, Page 4 of 7)

c. Weapons authorized

(1) FAW, automatic weapons, 20-mm, and 40-mm.
(2) Mortar 81-mm and 4.2-in.
(3) .30-cal 106 recoilless rifle, TOW missile.
(4) All other small arms (familiarization).

d. Description. The range consists of four distinct areas. Target drone launch area, 50 firing points, a move-shoot-move area, and a small arms area. Each area has its own left and right limit panel. Both hard targets and panels are available. Target drones may be used when authorized. Range flag is located at CF 610595.

10. Dona Ana 48, CF 658638 (center of range). (North boundary is East-West Grid Line 68).

a. Primary use. Field artillery, indirect and direct fire.
b. Secondary use. Tank indirect fire, helicopter gunship firing in support of infantry squad battle runs (mounted or dismounted), helicopter gunnery.
c. Weapons authorized.

(1) 105-mm.
(2) 155-mm.
(3) 8-in.
(4) 105-mm tank main gun.
(5) 81-mm and 4.2-in mortar.
(6) 2.75-in FFAR.
(7) 20-mm.
(8) 7.62-mm minigun.
(9) M-16 (familiarization).

d. Description. This range has 14 surveyed artillery firing points and two operation patrols dispersed over 20 km^2. The firing points are marked by small concrete pads with a brass shell case and a 10-foot pole. Range Cards are available at Dona Ana Range Control.

11. Dona Ana 49, CF 657685. (South boundary is East-West Grid Line 68).

a. Primary use. Tank Table VI and Tank Table VII.
b. Secondary use. Automatic weapons moving and stationary range, ground fire, Tank Table VII, and field artillery indirect fire.

Table D-2. Dona Ana Ranges and Range Descriptions (Continued, Page 5 of 7)

c. Weapons authorized.

(1) 15[illegible]-mm.
(2) 165-mm.
(3) 105-mm main gun.
(4) .50-cal machinegun.
(5) M-60 machinegun.
(6) 20-mm.
(7) 40-mm, M-42 Duster.
(8) M-16 (dismounted troop training).
(9) 4.2-in and 81-mm mortar.
(10) TOW missile.
(11) Dragon.

d. Description. Tank Table VI is a combination moving and stationary target tank range for .50-cal, M-60 machinegun, MISPC, and SSPC.

12. Dona Ana 50, CF 651725 to 662698.

a. Primary use. Air defense automatic weapons.
b. Secondary use. Tank main gun and field artillery indirect fire.
c. Weapons authorized.

(1) 20-mm.
(2) 40-mm.
(3) .50-cal machinegun.
(4) .30-cal machinegun.
(5) M-60 machinegun.
(6) [illegible]-mm.
(7) TOW missile.
(8) 155-mm.
(9) Dragon.

d. Description. The range has 63 firing points with 6 control towers. Both ground and aerial fire are authorized. Aerial targets available upon request.

13. Dona Ana 51, CF 648731.

a. Primary use. Tank Table IV (main gun zeroing).
b. Secondary use. M-60 familiarization and field artillery indirect fire.
c. Weapons authorized.

(1) 105-mm.
(2) 155-mm.
(3) Dragon.
(4) M-60 machinegun.
(5) TOW missile.

Table D-2. Dona Ana Ranges and Range Descriptions (Continued, Page 6 of 7)

d. Description. Stationary target tank range for 105-mm main gun (bore sight and zero).

14. Dona Ana 52, CF 644744.

a. Primary use. M-60 machinegun transition firing range, Tank Table VI.
b. Secondary use. M-60 machinegun 10-m zero firing range (12 points) and FAW indirect fire.
c. Weapons authorized.

(1) M-60 machinegun.
(2) 4.2-in and 81-mm mortar, illumination only.
(3) 155-mm.

d. Description. The range consists of 5 firing lanes with popup E-type silhouette targets at varying ranges from 100 to 500 m. A 12-point, 10-m machinegun zero range is also available with 1-m by 1.5-m panel targets.

15. Dona Ana 53, CF 642749 to 641750.

a. Primary use. M-79 and M-203 grenade launcher, LAW, familiarization, and qualification.
b. Secondary use. Field artillery indirect fire.
c. Weapons authorized.

(1) M-79 and M-203 grenade launcher.
(2) 66-mm and 35-mm LAW.
(3) TOW missile.
(4) 155-mm.
(5) Dragon.

d. Description. M-79 and M-203 grenade launcher range has 4 lanes, 3 positions. M-79 LAW range has 15 firing points with hard targets.

16. Dona Ana 54, CF 638758 to 637762.

a. Primary use. Tank Table V.
b. Secondary use. ADA guns, ground fire, and field artillery indirect fire.
c. Weapons authorized.

(1) 20-mm Vulcan (TPT only).
(2) 40-mm, M-42 (TPT only).
(3) Tank cannons.
(4) Machineguns M-60, and .50-cal.
(5) 4.2-in and 81-mm illumination only.

Table D-2. Dona Ana Ranges and Range Descriptions (Continued, Page 7 of 7)

d. Description. This range has a figure-8 track, beginning 800 m and extending to 2,600 m from the firing line. Firing line has space for 9 armored vehicles on line.	

Abbreviations:
FFAR = Folding-fin aerial rocket.
km^2 = square kilometers.
FM = Frequency modulation.
MISPC = Mechanized infantry squad proficiency course.
SSPC = Single-shot probability course.
TPT = Target practice with tracer.

Source: FTBL Range Command, 1981b.

Table D-3. Artillery, Mortar, and Missile Firing at Dona Ana Range in FY 1982

Type	No. of Rounds Fired
.50-cal Machine Gun	447,200
40-mm Antiaircraft Artillery	66,232
4.2-in Mortar	9,969
105-mm Tank Cannon	22,957
155-mm Self-Propelled Howitzer	5,079
8-in Self-Propelled Howitzer	780
TOW Missiles	72
Dragon Missiles	54
Pershing Missiles	*

* Additional 20-mm and bombs.

Source: FTBL DPT, 1982.

Table D-4. McGregor Range Descriptions

1. Nike Sites 1 and 2.

   a. Primary use. USAADS firing.
   b. Secondary use. Nike Service Practice and special firings.
   c. Description. Fire Control Site 1 is located at CF 929463. Fire Control Site 2 is located at CF 929464. The launcher area of Site 1 consists of an underground magazine with five aboveground launchers. Launcher Site 2 is an aboveground launcher area with three launchers. Nike targets are electronically-generated simulated targets (T1). Launchers are oriented at 800 mils.

2. Nike Sites 20 through 23.

   a. Primary use. Nike Service Practice.
   b. Secondary use. Special firings.
   c. Description. Fire control and launching areas are 3,420, 3,375, 3,105, and 2,700 m apart for Sites 20, 21, 22, and 23, respectively. Launchers are oriented at 800 mils. Electrical power is available. Each launcing area has two launchers, and an underground personnel shelter.

3. Hawk Sites 1 through 8.

   a. Primary use. Hawk Service Practice.
   b. Secondary use. Hawk Service Practice.
   c. Description. The firing sites are in a line from CF 936527 to CF 938513. Sites are 100 m apart. Concrete pads are provided for positioning at each radar. Protective shelters are provided for all firing personnel. Target drones are utilized for Hawk firings.

4. Field Firing Sites.

   a. Primary use. Hercules, Hawk, and Vulcan ARTEP firings.
   b. Secondary use. Hercules, Hawk, and Vulcan ARTEP firings.
   c. Description. Four firing sites currently exist for use of various ADA weapons. These areas afford units the opportunity to set up in a completely tactical environment.

5. FAW Site 10, CF 938501.

   a. Primary use. FAW firing.
   b. Secondary use. M-60 and .50-cal ground and aerial firing.

Table D-4. McGregor Range Descriptions (Continued, Page 2 of 4)

c. Weapons authorized.

1) Chaparral missile.
2) Redeye missile.
3) 20-mm Vulcan.
4) 81-mm mortar, illumination only.
5) Machinegun, M-60 and .50-cal.
6) 40-mm Duster.

d. Description. The range consists of a firing line to support 18 Vulcan firing points, 4 Chaparral firing points, and 2 Redeye firing points. Ground fire targets are emplaced at varying ranges. Left and right limits are marked. Below the control tower is an observation area (OP 10) with seating capacity for 450 visitors.

6. FAW Site 4, CF 948484.

a. Primary use. FAWs.
b. Secondary use. M-60 and .50-cal ground and aerial fire.
c. Weapons system authorized.

1) Redeye.
2) Chaparral.
3) Vulcan and 40-mm Duster.
4) 81-mm mortar, illumination only.
5) Machinegun M-60, .50-cal.

d. Description. Firing line has 18 points. Ground fire targets are emplaced at varying ranges. Below the control tower is an observation area with 50-plus personnel seating capacity.

7. Aerial Gunnery Range, Cane Cholla, CF 876546.

a. Primary use. Aerial gunnery.
b. Secondary use. M-72 LAW.
c. Weapons authorized.

1) 2.75-in aerial rockets.
2) 7.62-mm.
3) 40-mm.
4) 20-mm.
5) M-72 LAW.
6) 81-mm mortar.
7) 4.2-in mortar.

Table D-4. McGregor Range Descriptions (Continued, Page 3 of 4)

d. Description. The range consists of a 500-m by 3,000-m, well-defined firing lane with numerous point targets. The landing area is hard surfaced with two harmonization points, a control tower, and aircraft parking for support maintenance. Direction of fire is 35° magnetic. Observation point is located at CF 883545. An emergency landing pad is at CF 882538 when this range is active.

8. North McGregor Range, DF 057837.

a. Primary use. FAW Service Practice.
b. Secondary use. USARADBD tests and other tests/training approved by the Range Command Commander.
c. Weapons authorized.

1) Chaparral.
2) Vulcan.
3) Redeye.
4) 40-mm Duster.
5) 81-mm mortar, illumination only.
6) USARADBD firing.
7) As determined by the Range Command Commander.

d. Description. The range complex consists of 2 firing lines; Chaparral with 12 firing points and Redeye with 4 firing points. There is an observation point behind the Redeye firing line for 450 visitors. If possible, only the center 8 Chaparral firing points should be used.

9. Demolition Site 1 is located between the two Pershing launch facilities, CF 863509 to CF 864509.

a. Primary use. EOD.
b. Secondary use. Demolition training.
c. Description. There is one demolition pit approximately 140 m from observation shelters.

10. Demolition Site 2, CF 982502.

a. Primary use. EOD.
b. Secondary use. Demolition training.
c. Description. No facilities are available other than the demolition pit.

11. TFA No. 1, Dona Ana Maneuver Areas (minus the northern and northwest areas).

a. Primary use. Maneuver area, low-level, contour, and NOE training.
b. Secondary use. None.

Table D-4. McGregor Range Descriptions (Continued, Page 4 of 4)

12. TFA No. 2, McCregory Range.

    a. Primary use. Missile firings, tests and low-level, contour, and NOE training.
    b. Secondary use. As directed by the Commanding General, USAADCENFB.

13. TFA No. 3 (Low-Level/NOE Training Area).

    a. Primary use. NOE qualification and standardization training.
    b. Secondary use. None.
    c. Weapon authorized. None.

Source: FTBL Range Command, 1981b.

Table D-5. Types of Missiles Fired at McGregor Ranges

Missile	Year	Number Fired
LaCrosse	1961	6
Corporal	1959-1962	156
Sergeant	1963	10
Honest John	1960-1962	12
Pershing I	1971-1982	68
Redeye	1971*-1982	1,705
Chaparral	1971*-1982	1,363
Stinger	1980-1982	64
Hawk	1982	65
Hercules	1982	35
Pershing II	1982	8
TOTAL		~10,812

* Missile firings for these were never kept prior to 1971.

Source: FTB. Range Command, 1981a.
FT3L Range Command, n.d.

APPENDIX E

NIPDWR AND NSDWR MAXIMUM CONTAMINANT LEVELS AND USADWSP DATA

Table E-1. Maximum Contaminant Levels According to the NIPDWR and NSDWR

Contaminant	Maximum Contaminant Level
I. NIPDWR (EPA, 1982d):	
Inorganic Contaminants	
Arsenic	0.05
Barium	1.0
Cadmium	0.010
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate (as N)	10.0
Selenium	0.01
Silver	0.05
Organic Contaminants	
Endrin	0.0002
Lindane	0.004
Methoxychlor	0.10
Toxaphene	0.005
2,4-Dichlorophenoxy[illegible]tic Acid	0.1
2,4,5-TP Silvex	0.01
Total Trihalomethanes	0.1
Radionuclides	
Gross Alpha Particle Activity	15 (pCi/l)
Radium-226 + Radium-228	5 (pCi/l)
Tritium	20,000 (pCi/l)
Strontium-90	8 (pCi/l)
II. NSDWR (EPA, 1982e):	
Chloride	250
Color	15 (color units)
Copper	1.0
Corrosivity	(Noncorrosive)
Foaming Agents	0.5
Iron	0.3
Manganese	0.05
Odor	3 (TON)†
pH	(6.5-8.5)
Sulfate	250
Total Dissolved Solids (TDS)	500
Zinc	5

Note: Units of measurement are given in mg/l, unless specified in parentheses ( ).

N = Nitrogen.
pCi/l = picocuries per liter.
TON = Threshold Odor Number.

DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

DWSP Source Codes

Source codes used for the DWSP data base follow:

Code	Description
RS	Raw Surface Water
TS	Treated Surface Water
RW	Raw Well Water
TW	Treated Well Water
TM	Treated Mixed (surface and well) Water
T	Treated Water (normally purchased-source not verified)

NOTE: Refer to US Army Drinking Water Surveillance Program Directory October 1977 for location identification for each source.

U.S. Army Drinking Water Surveillance Program Directory, October 1977

INSTALLATION NAME/ADDRESS	CODE NO.	SOURCE NO.	SOURCE IDENTIFICATION
12. BLISS, FORT Fort Bliss, TX 79916	548083	RW 01	Well 5
		TW 01	Fort Bliss Distribution System (Bldg. 1318)
		RW 02	Well 5
		TW 02	Biggs Area Distribution System (Bldg. 11171)
		RW 03	Well 7
		TW 03	Dona Distribution System
		RW 04	Well 9
		TW 04	Orogrande Distribution System, Supplied by White Sands Missile Range
		RW 05	Well 10
		TW 05	Logan Heights Distribution System, Purchased, City of El Paso
		RW 06	Well 11
		TW 06	Van Horne Distribution System, Purchased, City of El Paso
		RW 07	Well 12
		TW 07	Aero Vista Distribution System, Purchased, City of El Paso
		RW 08	Well 13
		TW 08	Castner Annex Distribution System, Purchased, City of El Paso
		RW 09	Well 14
		TW 09	McGregor Range Distribution System, Purchased, City of El Paso
		RW 10	Well 15
		RW 11	Well 16
		RW 12	Biggs Area Well 1A
		RW 13	Biggs Area Well 2A
		RW 14	Dona Ana Target Range Well No. 2
		RW 15	Dona Ana Target Range Well No. 3
		RW 16	Hueco Firing Point Well No. 3
		RW 17	Site Monitor Well 2

548083 FT. BLISS, TX

SOURCE RW01

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.8	< .005	< .0002	2.9	.000	< .010	42.8
MEAN	.022	.36	.003	.025	1.1	.020	.0003	3.5	.000	.022	69.6
MAX	< .030	.54	.005	< .025	1.3	.069	.0016	4.3	.000	< .028	144.0
NR OBS	4	4	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< 1.4	5.8	< .0003	.00	.00	.10	< .02[illegible]	< .1	14.2	< .03	< .001
MEAN	2.3	7.5	.0503	.00	.00	.33	.043	.1	14.9	.03	.108
MAX	2.9	9.5	< .1000	.00	.00	.79	.085	< .1	15.8	< .03	.390
NR OBS	4	4	4	0	0	4	4	4	4	4	4

	COLCR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	.0	153.0	7.6	159.0	34[illegible]	43.4	4.40	12.0	335.0	30.0	45.0
MEAN	2.5	161.0	7.9	169.2	492.	45.3	4.86	27.6	356.5	34.9	52.6
MAX	5.0	175.0	8.0	181.0	570.	47.2	5.20	41.4	381.0	41.6	62.0
NR OBS	2	4	4	4	4	4	4	4	4	4	4

SOURCE RW02

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	1.0	< .005	< .0002	2.3	.000	< .010	47.6
MEAN	.025	.35	.003	.025	1.3	.008	.0002	2.7	.000	.022	62.2
MAX	< .030	.48	< .005	< .025	1.6	< .010	.0010	2.9	.000	< .028	94.0
NR OBS	4	4	4	4	4	4	3	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< 1.9	7.0	< .0053	.00	2.00	.10	< .025	< .1	12.3	< .03	< .001
MEAN	4.2	7.7	.0751	.00	2.00	.16	.027	.2	13.1	.03	.027
MAX	6.8	9.2	< .1000	.00	2.00	.23	.034	.2	13.8	< .03	.046
NR OBS	4	4	4	0	1	4	4	4	4	4	4

	COLCR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	145.0	7.5	124.0	423.	35.0	4.40	10.7	310.0	36.8	41.0
MEAN	5.0	150.2	7.7	164.0	497.	38.6	4.75	23.5	334.7	41.4	48.4
MAX	5.0	158.0	7.8	216.0	556.	42.6	5.30	34.1	363.0	44.0	57.5
NR OBS	1	4	4	4	4	4	4	4	4	4	4

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SOURCE RW03

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.2	< .005	< .0002	.4	.000	< .010	78.9
MEAN	.025	.30	.004	.025	1.0	.008	.0002	2.5	.000	.021	86.0
MAX	< .030	< .30	< .005	< .025	1.3	.014	< .0004	5.4	.000	< .025	97.0
NR OBS	4	4	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	3.0	5.5	< .0003	.00	.80	< .04	< .025	< .1	2.7	< .03	< .015
MEAN	6.9	7.3	.0502	.00	1.03	.11	.032	.1	19.3	.03	.034
MAX	10.5	9.1	< .1000	.00	1.30	.24	.052	.1	42.8	< .03	.067
NR OBS	4	4	4	0	3	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	129.0	6.9	158.0	704.	8.1	5.55	10.4	393.0	71.9	72.0
MEAN	5.0	150.8	7.5	177.2	755.	66.8	5.94	26.2	436.0	81.8	81.0
MAX	5.0	167.3	7.9	220.0	848.	176.0	6.10	32.7	481.0	91.0	94.0
NR OBS	2	4	4	4	4	4	4	4	4	4	4

SOURCE RW04

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.1	< .005	< .0002	1.7	.000	< .010	58.8
MEAN	.025	.30	.004	.025	.5	.007	.0003	3.3	.000	.021	65.1
MAX	< .030	< .30	< .005	< .025	.6	< .010	.0006	5.4	.000	< .025	67.7
NR OBS	4	4	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	2.2	6.7	< .0003	.00	.50	.15	< .025	< .1	30.5	< .03	.017
MEAN	4.1	7.8	.0502	.00	.85	.25	.025	.1	44.2	.03	.030
MAX	5.1	8.9	< .1000	.00	1.20	.35	< .025	< .1	68.0	< .03	.040
NR OBS	4	4	4	3	2	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	3.0	179.0	7.3	278.0	775.	23.5	5.40	16.0	575.0	57.0	60.0
MEAN	4.0	187.4	7.5	356.5	963.	118.4	5.97	32.8	686.7	136.1	72.5
MAX	5.0	197.6	7.8	436.0	1152.	200.0	6.90	41.8	729.0	204.0	82.0
NR OBS	2	4	4	4	4	4	4	4	4	4	4

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345083 FT. BLISS, TX

SOURCE: RW05

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	1.2	< .005	< .0002	1.6	.000	< .001	16.1
MEAN	.024	.31	.002	.025	1.3	.008	.0024	2.1	.000	.015	95.7
MAX	< .030	< .36	< .005	< .025	1.5	< .010	.0006	2.5	.000	< .028	124.8
NR OBS	5	5	5	5	5	5	5	5	0	5	5

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< 1.2	8.1	< .0003	1.40	.00	.22	< .025	< .1	.8	< .03	.009
MEAN	4.2	10.2	.0404	1.40	.00	.25	.025	.1	7.0	.03	.095
MAX	7.2	13.9	< .1000	1.40	.00	.28	< .025	.1	9.4	< .03	.398
NR OBS	5	5	5	1	0	5	5	5	5	5	5

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	153.0	7.3	92.0	623.	22.0	2.50	10.5	345.0	64.6	44.0
MEAN	5.0	158.8	7.9	97.2	669.	24.3	8.86	29.4	420.0	71.8	78.6
MAX	5.0	164.0	8.3	100.0	718.	25.8	13.40	37.5	451.0	88.0	97.0
NR OBS	2	5	5	5	5	5	5	5	5	5	5

SOURCE: RW08

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	1.2	< .005	< .0002	1.7	.000	< .001	10[illegible].4
MEAN	.023	.31	.002	.025	1.3	.008	.0004	2.2	.000	.016	10[illegible].5
MAX	< .030	< .36	< .005	< .025	1.4	< .010	.0009	2.8	.000	< .028	11[illegible].9
NR OBS	3	4	4	1	3	4	4	3	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< .8	8.1	.0006	4.60	.20	< .04	< .025	< .1	8.2	< .03	< .001
MEAN	3.4	12.3	.0503	4.60	.20	.11	.021	.3	11.1	.03	.044
MAX	5.8	16.6	< .1000	4.60	.20	.20	.033	.6	18.9	< .03	.079
NR OBS	4	4	4	1	1	3	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO
MIN	5.0	150.0	7.7	94.0	610.	24.0	8.76	9.7	230.0	59.0	78.0
MEAN	5.0	155.0	8.0	99.3	671.	25.5	10.29	29.6	307.3	68.4	85.7
MAX	5.0	162.0	8.3	104.0	731.	27.2	11.90	44.0	443.0	76.2	93.0
NR OBS	1	3	3	3	3	4	4	3	3	3	

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548003 FT. BLISS, T

SOURCE, RW07

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.5	< .005	< .0002	1.6	.000	< .001	69.8
MEAN	.022	.31	.003	.025	.9	.007	.0001	2.1	.000	.018	89.5
MAX	< .030	< .36	< .005	< .025	1.2	< .010	.0001	3.0	.000	< .028	148.5
NR OBS	5	5	5	5	5	5	5	5	0	5	5

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< .7	2.7	.0004	3.20	2.00	.09	< .025	< .1	5.7	< .03	< .001
MEAN	3.0	10.3	.0407	3.20	2.00	.13	.025	.3	8.9	.03	.029
MAX	5.6	14.3	.1000	3.20	2.00	.18	.025	.8	16.1	< .03	.150
NR OBS	5	5	5	1	1	5	5	5	5	5	5

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	127.0	7.5	70.0	450.	16.0	8.41	6.8	239.0	37.5	49.1
MEAN	5.0	131.0	7.8	86.1	591.	21.4	9.72	29.7	350.0	58.8	68.8
MAX	5.0	135.0	8.4	124.0	1040.	36.1	10.40	45.0	556.0	129.5	130.0
NR OBS	1	5	5	5	5	5	5	5	5	5	5

SOURCE, RW08

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.7	< .005	< .0003	1.7	.000	< .001	76.9
MEAN	.022	.31	.002	.025	.9	.008	.0003	2.0	.000	.010	80.7
MAX	.030	< .36	< .005	< .025	1.1	< .010	.0005	2.6	.000	< .028	89.2
NR OBS	4	4	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	4.3	10.8	.0033	.70	.00	< .10	< .025	< .1	5.8	< .03	< .001
MEAN	4.6	12.8	.0502	1.95	.00	.14	.025	.1	9.9	.03	.011
MAX	5.0	14.7	< .1000	3.20	.00	.19	< .025	.1	17.0	< .03	< .020
NR OBS	4	4	4	2	0	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	132.0	7.4	66.0	470.	17.0	8.75	8.8	228.0	42.0	50.6
MEAN	5.0	135.7	7.8	72.8	511.	18.5	10.51	27.9	303.2	43.7	54.5
MAX	5.0	140.0	8.4	80.0	540.	21.0	12.30	42.0	340.0	46.0	60.0
NR OBS	1	4	4	4	4	4	4	4	4	4	4

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SOURCE RW11

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.9	< .005	< .0002	.1	.000	< .025	71.8
MEAN	.023	.38	.004	.025	1.0	.054	.0003	1.1	.000	.025	77.8
MAX	< .030	.54	< .005	< .025	1.2	.142	.0004	2.0	.000	< .025	81.8
NR OBS	3	3	3	3	3	3	3	3	0	3	3

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< .7	8.9	.0008	3.20	.00	.06	< .025	< .1	3.5	< .03	.015
MEAN	1.9	10.8	.0669	3.20	.00	.12	.129	.1	4.2	.07	.048
MAX	3.8	13.2	< .1000	3.20	.00	.20	.337	< .1	5.5	< .08	.115
NR OBS	3	3	3	1	0	3	3	3	3	3	3

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	.0	101.0	7.8	78.0	451.	16.9	6.90	3.4	313.0	61.1	32.0
MEAN	.0	119.7	7.8	78.7	510.	19.3	8.37	23.0	341.3	66.4	41.3
MAX	.0	137.0	7.9	80.0	550.	23.0	10.30	33.5	371.0	70.0	49.0
NR OBS	0	3	3	3	3	3	3	3	3	3	3

SOURCE RW12

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.8	< .005	< .0002	1.7	.000	< .001	70.1
MEAN	.025	.51	.002	.025	.9	.008	.0004	1.9	.000	.315	77.9
MAX	< .030	< .36	< .005	< .025	1.1	< .010	.0009	2.0	.000	< .028	89.2
NR OBS	4	5	5	3	5	5	5	4	0	5	5

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	1.7	10.[illegible]	.0008	.30	.00	.18	< .025	< .1	5.9	< .03	< .001
MEAN	3.1	11.3	.0406	1.00	.00	.24	.035	.1	7.1	.05	.046
MAX	4.2	13.9	< .1000	1.40	.00	.28	.070	.3	8.8	.14	.102
NR OBS	5	5	5	3	0	5	5	5	5	5	5

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	127.0	7.2	68.0	438.	17.6	8.10	13.8	284.0	28.3	53.0
MEAN	5.0	136.8	7.9	79.5	484.	19.7	11.14	27.8	312.2	32.2	58.9
MAX	5.0	141.0	8.4	92.0	514.	21.3	16.50	34.0	356.0	35.3	63.0
NR OBS	2	5	5	5	5	5	5	5	5	4	5

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SOURCE: RW09

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.9	< .005	< .0002	.3	.000	< .010	70.7
MEAN	.022	.35	.004	.025	1.0	.006	.0003	1.4	.000	.021	73.5
MAX	< .030	< .50	.008	< .025	1.1	< .010	.0004	2.0	.000	< .025	77.5
NR OBS	4	4	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MO	MN	ZN
MIN	< .7	4.5	.0038	.40	.00	< .10	< .025	< .1	4.7	< .03	< .015
MEAN	1.9	8.4	.0503	1.83	.03	.14	.031	.2	5.5	.03	.019
MAX	3.2	11.0	< .1000	2.80	.20	.20	< .050	.3	6.1	< .03	.028
NR OBS	4	4	4	2	0	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	.0	119.0	7.7	76.1	492.	17.8	9.20	5.2	289.0	43.5	40.0
MEAN	2.5	129.0	7.8	83.5	531.	19.9	11.40	25.7	333.2	61.9	48.6
MAX	5.0	146.0	8.0	92.0	620.	24.0	15.30	33.0	376.0	95.3	54.0
NR OBS	2	4	4	4	4	4	4	4	4	4	4

SOURCE: RW10

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.9	< .005	< .0002	.2	.000	< .010	72.2
MEAN	.022	.35	.003	.025	1.0	.006	.0005	1.4	.000	.021	84.3
MAX	< .030	< .50	.008	< .025	1.1	< .010	.0006	2.0	.000	< .025	98.1
NR OBS	4	4	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MO	MN	ZN
MIN	< .7	7.1	.0035	.00	.00	.08	< .025	< .1	4.0	< .03	< .015
MEAN	1.6	8.7	.0503	.50	.00	.15	.031	.1	6.3	.03	.022
MAX	2.7	10.3	< .1000	.60	.00	.25	< .050	< .1	9.0	< .03	.035
NR OBS	4	4	4	0	0	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	101.0	7.6	71.6	483.	17.9	5.60	7.5	295.0	39.5	22.0
MEAN	5.0	114.7	7.8	92.4	597.	24.3	8.30	26.7	368.0	88.1	38.3
MAX	5.0	128.0	7.9	111.0	760.	29.8	10.70	34.0	480.0	168.0	49.0
NR OBS	1	4	4	4	4	4	4	4	4	4	4

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SOURCE RW13

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.9	< .005	< .0002	1.8	.000	< .001	76.9
MEAN	.025	.31	.002	.025	1.2	.008	.0024	1.9	.000	.015	86.7
MAX	< .030	< .36	< .005	< .025	1.5	< .010	.0088	2.0	.000	< .028	93.1
NR OBS	4	5	5	5	5	5	5	4	0	5	5

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	.5	8.8	< .0003	1.30	.20	.11	< .025	< .1	.8	< .03	< .001
MEAN	4.1	11.3	.0405	1.30	.80	.21	.027	.1	5.7	.03	.034
MAX	10.3	13.1	< .1000	1.30	1.40	.29	.036	.3	8.9	< .03	.079
NR OBS	5	5	5	1	2	5	5	5	5	5	5

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	140.0	6.3	69.1	423.	14.8	2.50	12.6	318.0	31.1	55.0
MEAN	5.0	147.0	7.7	77.9	521.	17.9	10.02	28.4	327.4	35.7	59.0
MAX	5.0	154.0	8.4	86.0	560.	19.0	16.60	35.2	334.0	38.0	64.0
NR OBS	2	5	5	5	5	5	5	5	5	4	5

SOURCE RW14

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.6	< .005	< .0002	1.1	.000	< .010	53.7
MEAN	.025	.30	.003	.025	13.5	.007	.0002	2.8	.000	.021	66.3
MAX	< .030	< .30	< .005	< .025	**	< .010	.0003	8.3	.000	< .025	80.8
NR OBS	4	4	4	4	4	3	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< 1.2	4.3	.0004	.00	.10	< .05	< .025	< .1	17.0	< .03	.053
MEAN	3.6	7.0	.0503	.00	.10	.13	.025	.2	18.4	.03	.080
MAX	7.4	11.4	< .1000	.00	.10	.23	< .025	.3	19.5	< .03	.105
NR OBS	4	4	4	0	1	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	181.0	7.4	172.0	420.	33.0	3.10	4.9	160.0	11.0	15.9
MEAN	5.0	188.7	7.7	185.4	599.	36.3	3.95	25.4	338.0	31.1	49.7
MAX	5.0	198.0	8.0	190.0	710.	42.1	4.90	33.2	416.0	69.4	60.1
NR OBS	1	4	4	4	4	4	4	4	4	4	4

548083 FT. BLISS, TX

SOURCE: RW15

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.5	< .005	< .0002	1.2	.000	< .010	53.3
MEAN	.025	.30	.003	.035	.6	.006	.0003	1.6	.000	.021	58.9
MAX	< .030	< .30	< .005	< .025	.9	< .010	.0006	2.2	.000	< .025	64.8
NR OBS	4	4	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	2.3	3.3	.0006	.00	.00	< .05	< .025	< .1	16.8	< .03	< .015
MEAN	3.5	4.4	.0503	.00	.00	.12	.025	.1	17.4	.03	.029
MAX	4.6	5.2	< .1000	.00	.00	.21	< .025	.2	19.0	< .03	.049
NR OBS	4	4	4	0	0	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	8.3	7.4	147.0	400.	35.5	2.80	5.0	352.0	6.1	11.0
MEAN	5.0	145.6	26.4	163.9	550.	38.5	3.78	25.7	389.5	31.8	47.5
MAX	5.0	196.2	***	182.0	700.	43.0	4.40	34.6	390.0	48.4	65.0
NR OBS	1	4	4	4	4	4	4	4	4	4	4

SOURCE: RW13

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .01	< .30	< .001	< .025	< .1	< .005	< .0007	< .1	.000	< .010	108.2
MEAN	.02	.35	.004	.025	.4	.008	.0003	1.7	.000	.022	117.0
MAX	< .030	.55	< .005	< .025	.7	.012	.0004	4.0	.000	< .025	125.0
NR OBS	5	5	5	5	5	5	5	5	0	5	5

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	.5	3.1	< .0003	1.40	2.02	< .10	< .025	.1	11.5	< .03	.024
MEAN	.8	10.1	.0602	1.50	2.02	.19	.039	.2	39.8	.03	.050
MAX	< .4	16.4	< .1000	1.60	2.02	.32	.095	.2	62.2	< .03	.110
NR OBS	5	5	5	2	1	5	5	5	5	5	5

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	.0	66.0	7.5	458.0	1531.	118.0	11.56	15.0	460.0	313.0	34.0
MEAN	2.5	73.8	7.6	465.3	1565.	177.8	14.41	31.7	1247.0	429.2	47.7
MAX	5.0	80.0	7.8	475.0	1665.	256.0	15.30	39.0	1644.0	542.0	58.0
NR OBS	3	5	5	3	5	5	5	4	5	4	5

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54C063 FT. BLISS, TX

SOURCE: WW17

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.6	< .005	< .0002	.4	.000	< .010	137.4
MEAN	.030	.30	.001	.025	.9	.008	.0002	.9	.000	.017	141.7
MAX	.040	< .30	< .001	< .025	1.4	< .010	< .0002	1.2	.000	< .025	146.0
NR OBS	3	3	2	2	3	2	2	3	0	2	2

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	2.4	7.7	.0005	.00	.00	< .10	< .025	.2	8.9	< .03	.056
MEAN	3.2	9.1	.0668	.00	.00	.23	.025	.3	9.7	.03	.099
MAX	4.6	10.6	< .1000	.03	.00	.36	< .025	.4	10.6	< .03	.142
NR OBS	3	3	3	0	0	3	2	2	2	2	2

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	128.2	7.8	123.0	909.	34.2	8.00	17.5	561.0	113.0	138.0
MEAN	5.0	131.1	7.9	125.3	933.	34.8	8.85	26.1	605.0	145.5	142.7
MAX	5.0	135.0	8.2	128.0	954.	35.5	9.70	30.7	667.0	205.0	146.0
NR OBS	1	3	3	3	3	2	2	3	3	3	3

SOURCE: WW18

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.9	< .005	< .0002	.2	.000	< .001	58.0
MEAN	.023	.31	.003	.025	1.1	.018	.0002	2.4	.000	.319	75.3
MAX	< .030	< .36	.006	< .025	1.3	.060	.0002	4.4	.000	< .028	107.1
NR OBS	6	6	6	3	6	6	5	6	0	6	6

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< .7	5.6	< .0003	3.20	.00	.10	< .025	< .1	8.2	< .03	< .001
MEAN	3.7	9.0	.0505	3.20	.00	.23	.031	.3	14.7	.03	.034
MAX	6.5	12.5	< .1000	3.20	.00	.52	.045	.4	19.2	< .03	.095
NR OBS	6	6	6	1	0	6	6	6	6	6	6

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	.0	138.0	7.3	146.0	545.	25.9	4.00	< 1.0	384.0	58.5	48.0
MEAN	2.5	156.8	7.8	186.5	689.	46.2	5.53	23.9	468.0	88.1	65.6
MAX	5.0	171.0	8.4	232.0	1016.	67.3	6.70	39.8	734.0	196.0	78.0
NR OBS	2	6	6	6	6	6	6	6	6	6	6

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3-11

548083 FT. BLISS, T*

SOURCE TW02

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.8	< .005	< .0002	1.8	.000	< .001	78.4
MEAN	.025	.31	.002	.025	1.0	.009	.0004	1.9	.000	.015	84.4
MAX	< .030	< .38	< .005	< .025	1.2	< .010	.0007	2.1	.000	< .028	90.0
NR OBS	4	5	5	5	5	5	5	4	3	5	5

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< .8	8.9	< .0003	1.40	.00	.15	< .025	< .1	.6	< .03	< .001
MEAN	2.0	11.3	.0405	2.30	.00	.20	.025	.1	5.7	.03	.048
MAX	3.3	14.3	< .1000	3.20	.00	.26	< .025	< .1	8.9	< .03	.077
NR OBS	5	5	5	2	0	5	5	5	5	5	5

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	123.0	7.7	68.0	423.	14.8	2.60	11.6	287.0	32.9	55.0
MEAN	5.0	142.4	8.0	75.9	503.	18.1	10.42	27.6	317.8	34.8	59.3
MAX	5.0	157.0	8.5	88.0	543.	21.5	17.60	34.9	340.0	37.5	61.0
NR OBS	2	5	5	5	5	5	5	5	5	4	5

SOURCE TW03

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.6	< .005	< .0002	1.2	.000	< .010	53.1
MEAN	.025	.30	.003	.025	1.1	.006	.0004	2.0	.000	.021	69.4
MAX	< .030	< .30	< .005	< .025	1.5	< .010	.0007	6.0	.000	< .025	80.6
NR OBS	4	4	4	4	4	4	4	4	4	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	3.0	3.8	.0008	.00	.10	< .05	< .025	< .1	16.8	< .03	.044
MEAN	3.9	5.2	.0564	.00	.10	.16	.025	.2	17.9	.03	.170
MAX	5.5	6.4	< .1000	.00	.10	.29	< .025	.3	19.1	< .03	.450
NR OBS	4	4	4	0	1	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	170.0	7.5	163.0	484.	33.8	3.00	4.5	372.0	9.8	21.0
MEAN	5.0	181.2	7.7	172.2	591.	36.7	4.13	25.1	446.5	43.5	50.3
MAX	5.0	192.0	7.9	182.0	715.	40.0	5.10	33.7	510.0	66.0	65.0
NR OBS	1	4	4	4	4	4	4	4	4	4	4

548083 FT. BLISS, Tx

SOURCE: TW04

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.4	< .005	< .0002	1.6	.000	< .010	27.5
MEAN	.022	.30	.004	.025	.5	.006	.0003	2.2	.000	.021	29.3
MAX	< .030	< .30	< .005	< .025	.7	< .010	< .0004	2.7	.000	< .025	31.0
NR OBS	4	4	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< .8	< 1.9	.0004	.00	.00	< .04	< .025	.1	6.8	< .03	< .015
MEAN	1.0	3.5	.0502	.00	.00	.08	.036	.1	8.8	.03	.024
MAX	1.3	4.5	< .1000	.00	.00	< .10	.069	.2	11.7	< .03	.040
NR OBS	4	4	4	0	0	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	.0	40.0	7.6	127.0	410.	41.5	1.86	19.6	290.0	15.0	63.0
MEAN	2.5	102.0	7.9	146.0	429.	48.8	2.55	34.2	311.2	22.0	69.4
MAX	5.0	127.0	8.3	163.0	444.	56.1	3.10	41.4	328.0	34.0	81.5
NR OBS	2	4	4	1	4	4	4	4	4	4	4

SOURCE: TW05

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	1.0	< .005	< .0002	1.4	.000	< .001	61.1
MEAN	.024	.31	.002	.025	1.2	.008	.0004	2.0	.000	.015	81.4
MAX	< .030	< .38	< .005	< .025	1.4	< .010	.0007	3.7	.000	< .028	109.1
NR OBS	5	5	5	5	5	5	5	5	0	5	5

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< 1.3	6.7	< .0003	.00	.00	.13	< .025	< .1	8.9	< .03	< .001
MEAN	3.5	8.9	.0434	.00	.00	.21	.025	.1	13.0	.03	.045
MAX	7.2	13.8	< .1000	.00	.00	.26	< .025	.2	18.3	< .03	.092
NR OBS	5	5	5	0	0	5	5	5	5	5	5

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	136.0	7.6	140.0	600.	32.3	3.60	4.6	288.0	66.2	55.0
MEAN	5.0	152.2	8.0	161.2	685.	40.4	5.28	26.1	409.8	81.6	68.1
MAX	5.0	158.0	8.4	193.0	755.	56.1	6.60	35.0	461.0	88.3	77.4
NR OBS	2	5	5	4	5	5	5	5	5	5	5

548083 FT. BLISS, TX

SOURCE : TW08

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.1	< .005	< .0002	.8	.000	< .010	72.0
MEAN	.027	.31	.004	.025	.8	.007	.0003	1.8	.000	.020	96.7
MAX	< .030	.32	.006	< .025	1.1	< .010	.0004	2.9	.000	< .025	130.0
NR OBS	3	3	3	3	3	3	3	3	0	3	3

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< 1.4	3.6	< .0003	.00	< .20	< .04	< .025	< .1	9.7	< .03	< .015
MEAN	3.0	6.9	.0668	.00	.20	.14	.025	.1	11.2	.03	.017
MAX	5.0	9.1	< .1000	.00	< .20	.28	.026	< .1	13.0	< .03	< .020
NR OBS	3	3	3	0	1	3	3	3	3	3	3

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	122.1	7.2	128.0	704.	31.4	4.50	9.3	407.0	53.0	74.0
MEAN	5.0	147.4	7.6	172.0	790.	41.7	7.40	22.7	463.0	86.5	98.2
MAX	5.0	166.0	8.1	242.0	878.	53.7	11.10	34.6	500.0	113.0	125.0
NR OBS	1	3	3	3	3	3	3	3	3	3	3

SOURCE : TW07

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	1.0	< .005	< .0002	1.3	.000	< .001	78.8
MEAN	.022	.31	.002	.025	1.1	.008	.0004	1.9	.000	.318	95.3
MAX	< .030	< .36	< .005	< .025	1.3	< .010	.0007	2.1	.000	.037	109.1
NR OBS	4	4	4	1	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< .6	5.6	.0005	.00	.00	.13	< .025	< .1	9.8	< .03	< .001
MEAN	2.9	8.1	.0504	.00	.00	.14	.025	.1	10.8	.03	.019
MAX	4.3	11.6	< .1000	.00	.00	.15	< .025	< .1	13.0	< .03	.039
NR OBS	4	4	4	0	0	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	133.0	7.7	132.0	633.	34.4	4.60	4.2	299.0	60.0	62.0
MEAN	5.0	150.5	7.9	152.0	663.	36.2	6.20	23.8	390.0	81.6	66.6
MAX	5.0	166.0	8.2	177.0	745.	39.9	8.30	32.3	439.0	106.0	74.4
NR OBS	1	4	4	4	4	4	4	4	4	4	4

54C0E3 FT. BLISS, TX

SOURCE: TW03

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.7	< .005	< .0002	1.9	.000	< .010	92.5
MEAN	.025	.30	.002	.025	1.1	.007	.0008	2.4	.000	.020	98.4
MAX	< .030	< .30	< .005	< .025	1.4	< .010	.0020	2.9	.000	< .025	110.0
NR OBS	4	3	3	3	4	3	3	4	0	3	3

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	1.4	8.0	.0008	1.40	.00	.12	< .025	< .1	11.0	< .03	< .015
MEAN	2.3	13.1	.0503	1.40	.30	.20	.028	.1	11.9	.03	.131
MAX	3.1	17.8	< .1000	1.40	.00	.32	.035	< .1	12.7	< .03	.260
NR OBS	4	4	4	1	0	4	3	3	3	3	3

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	.0	108.0	7.7	136.0	720.	41.0	7.00	18.8	463.0	110.7	80.0
MEAN	.0	132.8	7.8	162.7	817.	45.0	7.67	28.0	494.7	131.3	88.0
MAX	.0	149.0	8.0	182.0	920.	49.8	8.40	32.9	528.0	151.0	104.0
NR OBS	0	4	4	4	4	3	3	4	0	4	4

SOURCE: TW04

	AS	BA	CD	CR	F	PB	HG	NO3	SE	AG	NA
MIN	< .020	< .30	< .001	< .025	.8	< .005	< .0002	1.5	.000	< .010	92.1
MEAN	.022	.30	.005	.025	1.1	.006	.0002	2.1	.000	.021	98.4
MAX	< .030	< .30	.008	< .025	1.5	< .010	< .0004	2.6	.000	< .025	105.0
NR OBS	4	3	4	4	4	4	4	4	0	4	4

	ALPHA	BETA	TRITIUM	90SR	226RA	B	CU	FE	MG	MN	ZN
MIN	< 1.0	6.0	< .0003	.00	.00	.18	< .025	< .1	9.2	< .03	< .015
MEAN	2.8	7.4	.0592	.00	.00	.21	.025	.1	11.9	.03	.020
MAX	4.8	9.0	< .1000	.00	.00	.25	< .025	< .1	15.6	< .03	.031
NR OBS	4	4	4	0	0	4	4	4	4	4	4

	COLOR	ALK	PH	HARD	SP C	CA	K	SI	TDS	CL	SO4
MIN	5.0	132.0	7.6	145.0	680.	41.0	6.55	30.4	427.0	90.0	69.0
MEAN	5.0	139.5	7.9	150.0	740.	47.6	7.17	31.6	465.7	103.7	77.9
MAX	5.0	148.0	8.4	155.0	794.	64.0	8.40	32.3	490.0	117.0	86.0
NR OBS	2	4	4	3	4	4	4	3	4	3	4

APPENDIX F
AIR QUALITY DATA

Table F-1. National Ambient Air Quality Standards

Pollutant and Type of Standard	Ambient Concentration Standard (ug/m^3) Primary	Secondary
Sulfur Oxides		
Annual Arithmetic Mean	80	--
24-Hour Maximum*	365	--
3-Hour Maximum*	--	1,300
Particulate Matter		
Annual Geometric Mean	75	60
24-Hour Maximum*	260	150
Carbon Monoxide		
8-Hour Maximum*	10,000	10,000
1-Hour Maximum*	40,000	40,000
Nitrogen Dioxide		
Annual Arithmetic Mean	100	100
Ozone		
1-Hour Maximum*	235	235
Hydrocarbons		
3-Hour Maximum*	160	160
Lead		
Annual Arithmetic Mean	1.5	1.5

* Not to be exceeded more than once a year.

ug/m^3 = micrograms per cubic meter.
-- = No standard.

Source: EPA, 1983.

Table F-2. Stationary Fuel Combustion Sources at FTBL

Building	Purpose/Description
57	Classified Waste Incinerator
2033	Installation Laundry Boiler
7776	WRAMC Boiler
7145	Type H Sterling Water Tube Boilers
7265	Pathological Incinerator

Source: USAEHA, 1982a.

Table F-3. Air Pollutant Emissions at FTBL

Pollutant	Fuel Combustion (kg/yr)	Waste Disposal (kg/yr)	POL Storage (kg/yr)	Vehicles* (kg/yr)
Particulates	3,901	1,451	--	18,144
Sulfur Oxides (SO_x)	726	181	--	38,102
Carbon Monoxide (CO)	16,329	1,814	--	1,477,796
Hydrocarbons	5,897	1,089	254,010	151,499
Nitrogen Oxides (NO_x)	58,876	181	--	420,932

* Assumes 7,788 km/yr military wheeled vehicles, 3,894 km/yr military tracked vehicles, 4,055 km/yr civilian commuters onpost.

-- = Not applicable.
km/yr = kilometers per year.

Source: FTBL, 1979.

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